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Editorial Notes

A Coal Price Appeal

IT is natural that great interest should focus on the important appeal of the Stretford and District Gas Board to the Midland District Committee of Investigation which began on Friday last. At the close of a lengthy hearing the case was adjourned until the beginning of November. A report of the proceedings appears on later pages of this issue.

The Government has met almost every criticism of the Coal Schemes by urging, almost monotonously, that complete protection from monopolistic selling powers can be obtained from the Committees of Investigation. These assurances have never convinced the public utilities, and the tendency in the past has been to "grin and bear it" rather than incur the great costs of an appeal to tribunals which were not regarded as satisfactory either in their composition or procedure. The new Coal Act has, however, given some redress, and the fact that the hearings are to be held in public has fostered public interest. It can be said, therefore, that the Stretford case is, in some measure, a test of the working of a Committee of Investigation.

The results were not, in our view, impressive. As constituted by the Act, the Committee is to consist of an impartial legal Chairman, two representatives of the coal interests, and two representatives of the consumers. Neither representative of the consumers was, we are sure through no fault of his own, able to be present. Rather than adjourn when Counsel and all the witnesses had been assembled, the Stretford Gas Board agreed to proceed with the hearing before the Chairman and the two coal representatives. It would, perhaps, be asking too much to expect the coal representatives to be impartial, but it was hardly to be expected that they would assume a right to cross-examine witnesses for the Gas Board after the normal cross-examination by the Counsel for the Coal Board. Questions asked by these representatives did not appear always to be relevant to the question at issue but ventured into the realm of the internal administration of the Gas Board.

When the question at issue is whether the price charged for coal to the Gas Board is fair, what is the relevance of a question from the bench as to the wages of gas stokers? Further, what is to be the answer of an industrialist called as a witness by the Gas Board, who is asked whether he sympathizes with the coal miners?

The main point at issue was clear. The Trafford Park area of the Stretford Gas Board is a highly industrial area. The enterprise of the Board has been such as to persuade many industrialists to supersede foreign oil by gas. To such industrialists the cost of their fuel is a vital question, and although patriotism and additional convenience may induce them to pay a little more for gas than for foreign oil there is a definite margin beyond which it would be impossible to raise the price of gas and at the same time retain the industrial load. That limit, in the opinion of Colonel Carr and the eminent industrialist who gave supporting evidence, has now been reached. An addition of 1s. per ton in the price of coal (making in all an increase of over 7s. 6d. on the 1936 prices) must involve an increase in the price of gas which in accordance with the coal clause contained in their contracts would, in part, fall upon the industrial consumer. The question is whether it is in the public interest that British coal should be supplanted by foreign oil. The real answer of the industrialist to the injustices of the coal-selling schemes is to refuse to use coal or coal products.

The Gas Industry is fully alive to this danger to which the coal interests appear strangely blind. Who are the sympathizers with the miners—the Gas Industry which tries to sell coal-gas and coke, or the coal interests who force up prices to a level which the public cannot reach? These contests between the coal interests and the Gas Industry—one of their best consumers—are unnatural and untimely. Rather should both these great British basic industries join hands in the task of ensuring that British industry is based upon British and not foreign raw material.

Industrial Gas Development

WE conclude to-day publication of the Paper which Mr. H. P. Lupton, of the Liverpool Gas Company, gave to the Manchester District Association of Gas Engineers. It was concerned with the experiences of a Gas Development Centre —that at Liverpool—and it held a lesson which should be taken to heart. That lesson is that no gas undertaking can afford to stand outside the Industrial Centres Scheme. Each undertaking should link up with and support the particular Centre covering its area of supply. Every undertaking has some potential industrial or commercial business. How many districts, for instance, are there where there are not possibilities of heating loads of a specialized character in dairies, butchers' shops, fish-frying establishments, and so on. The

public regards the Gas Industry as a whole; the mistakes, inefficiency, lack of enterprise of any one undertaking are reflected in public opinion and react on the whole Industry. And whenever a potential gas load is secured and held by a competing fuel the information quickly spreads and is used by our competitors. Again, with large firms having branches throughout the country poor gas service at any one branch is liable to have its repercussions at the other branches. If a load is lost at one branch it may have a serious effect on the business of other gas undertakings which are progressive. Undertakings which are not disposed to support the Centres scheme are doing themselves harm and they are doing the Gas Industry harm. We hope that the Paper by Mr. Lupton will force this fact home.

The Development Scheme was well planned and it is well organized. It has proved most fruitful in increased gas business and it has added to the Industry's prestige. Liverpool was quick to act when the setting up of regional centres was recommended in 1933, and the work the Liverpool Centre has accomplished since it has been in existence has been admirable. At the moment membership represents 76% of the total gas sales of the area covered. We think that Mr. Lupton's account of some of the problems which have been tackled and solved for the benefit of member undertakings should encourage other undertakings to raise this figure of 76%. The examples he gave should convince any gas engineer that Centres are a vital necessity to the development of the industrial gas load. Industrial gas problems can only be adequately handled by specialist staff, and it is quite certain that in many instances enquiries from industrial firms concerning the application of gas to their processes could not have been dealt with by individual gas undertakings.

The Centre provides not only a specialized staff but also showrooms and workshops where gas equipment can be seen in operation and where the problems of individual manufacturers can be investigated and new equipment designed. The *fait accompli* can be demonstrated in the presence of the manufacturer. Showrooms where such demonstrations can be carried out have proved of the utmost value. Because the industrial staff of gas undertakings know about modern automatically controlled gas appliances it must not be taken for granted that the industrial world knows about them too. Mr. Lupton pointed out in his Paper that the number of times the expression "I didn't know that gas could do that" has been heard in the Centre Showrooms would surprise many a gas engineer. Then there is the service of the Centre in loaning industrial appliances to member undertakings for local exhibitions—a service which has proved of considerable benefit.

A Matter for Surprise

THE success of the Liverpool Centre—and the success of the other Regional Centres which have been formed throughout the country—make it all the more surprising that a centre has not been established for the Manchester area. Surely the industrial nature of the district around Manchester calls for action in this regard. Soon after the scheme for regional centres had been recommended it was suggested that Manchester and Liverpool would form suitable headquarters for the north-west areas of the country. The Liverpool Gas Company immediately invited the gas undertakings in West Lancashire, West Cheshire, and North Wales to express their views regarding the establishment of a centre at Liverpool, and as a result a Committee was elected from the keen undertakings to work in conjunction with the Liverpool Company. In the meantime, as explained by Mr. Lupton in his Paper, Manchester had prepared a memorandum setting forth the duties and functions of a centre and laying down suggestions for the financial arrangements between a centre and its members. This memorandum, slightly modified, was approved by the Liverpool Gas Company and the Committee and formed the basis of the Liverpool Centre. Strangely enough Manchester area did nothing further of a concrete nature. This lack of action was commented on during the discussion on Mr. Lupton's Paper, when an appeal was made for the exercise of determination in starting a scheme in the Manchester district. We feel that this appeal must be heeded. It is well known that Manchester is keen on regional planning. Only a few weeks ago we recorded an interesting move by the Manchester Corporation to endeavour to organize the more important municipal services on a regional rather than a "Manchester" basis. A special committee, on which the interests of gas are naturally represented, has been appointed to investigate the possibility of co-ordinating a number of the public services of the city and local government areas. Why, we would ask, is so essentially an industrial area hanging fire on this matter of regional planning for the development of the industrial gas load?

Through the Centres organization the experience of the Industry can be put at the disposal of any member undertaking in a very short time. Some undertakings feel that they can look after their own enquiries and solve them in a satisfactory manner, but cases must arise where, without assistance, a possible load will not be gained, and the loss of such a load may easily cause the loss elsewhere of a similar kind of load. Naturally the full success of any Centre must depend on the efforts made by each constituent member. The first contact with a consumer must be made by the individual undertaking, and those undertakings which are keenest to develop their industrial business stand to derive most benefit from the Centres Scheme.

Illuminating Figures

THE Report of the Secretary for Mines for the year ended Dec. 31, 1937, has just been published, and, in common with former issues, it contains much information of interest to the Gas Industry and the carbonizing industries in general. How, for example, did recovery of benzole progress at gas-works in 1937? The figures in the report tell the story. Compared with 1936, there was the small increase of 0·7% in the quantity of benzole extracted from the gas produced—and it must be remembered that more gas was made in 1937 than in 1936. We can, in fact, "wash-out" the 0·7%. Was the reason for this static benzole year of 1937 due to fears that benzole recovery would have a serious influence on the coke market? Has the Gas Industry as a whole a coke marketing policy? There does appear to be a slump in the optimistic attitude regarding coke sales shown in 1936, in which year there was an increase of benzole scrubbed of over 15% on 1935. "Gang warily" with benzole recovery would seem to be the attitude in 1937. We think, though, that the figures in the Secretary for Mines' Reports for 1938 and 1939 relating to benzole recovery at gas-works will prove interesting. They may reflect a change in the 1937 attitude. Benzole was scrubbed from the gas from 51·7% of the total coal carbonized at gas-works in 1937. This compares with a figure of 47·3% in 1936.

What about low-temperature carbonization in 1937? The report before us gives a figure of 480,827 tons of coal "distilled" at low-temperature carbonization plants in that year. We find that 13 such plants were in operation on a com-

mercial or semi-commercial scale, as compared with 15 in 1936. The difference, we learn, "is accounted for by the fact that of the four plants which carbonized mixtures of pulverized coal and tar or oil in 1936, one closed down towards the end of that year, while at another the process was modified to the treatment of tar only." We believe that over 90% of the 480,827 tons of coal "distilled" at low-temperature carbonization plants in 1937 was "distilled" by one process—the original Parker process, developed to the stage of commercial working by Low Temperature Carbonisation, Ltd. We take off our editorial hat to Colonel Bristow for the progress he and his Company have made. That figure of 480,827 tons of coal treated in 1937 at low temperature will, we think, in terms of 1938 show an increase rather more than the 0·7% representing the growth of benzole recovery by gas undertakings in 1937 over 1936. Low Temperature Carbonisation, Ltd., has certainly taken pains to produce a satisfactory product and has taken pains to sell that solid smokeless fuel to the public. And few gas engineers could deny that at least some slight difficulty has been placed in the path of low-temperature carbonization. If gas engineers and managers had had half the faith in gas coke as has been displayed of recent years—particularly the last ten years—by Low Temperature Carbonisation, Ltd., in Coalite, then, maybe, we should probably have had a cheaper gaseous therm and fewer qualms concerning the inroad of electricity into the gas domain.

Hydrogenation

JUDGING by the statistics set out in the Report of the Secretary for Mines, Imperial Chemical Industries at Billingham have not made much headway in coal hydrogenation, as distinct from coal oil hydrogenation, for the production of motor spirit. In 1936 33¼ million gallons of motor spirit were made by hydrogenation. In 1937 the total was 35 million gallons. The increase in the quantity of coal hydrogenated was 10,000 tons—not a great deal. "In addition to coal"—we quote from the report—"substantial quantities of creosote and low-temperature tar oils were hydrogenated, as well as some high-temperature tar, anthracene oil, and neutral oil." The Billingham plant of I.C.I. did not by any means reach capacity in 1937, but technically its operation must be regarded as of first importance. Operation of the plant is said to have been "much steadier, and mechanical difficulties encountered during the earlier years have been overcome. The percentage yield of petrol obtained per ton of coal treated was improved." In the meantime the octane numbers of petrol from natural sources have shown a rise which at the moment is commanding. Imperial Chemical Industries are doubtless studying a technique to improve the octane number of the spirit resulting from the hydrogenation of coal; however that may be, the firm's investigations into the extraordinary way in which hydrogen functions under pressure have helped to build new industries, such as the plastics industry, and will, we feel sure, have their repercussions on the manufacture of town gas. As to the production of heavy oils in 1937, 114 million gallons of creosote and other heavy oil were produced in this country from coal tars obtained from the carbonization of coal and from the distillation of shale. This figure compares with 100 million gallons in 1936.

There are other items of interest to the Gas Industry in the Report of the Secretary for Mines. There is, for example, the substantial increase in the use of pulverized coal for steam raising and for heating purposes. The metallurgical industry consumed 16% more pulverized fuel in 1937 than in 1936 and over six times as much as in 1929. Mention is made in the report of the pulverizing plants which have been set up in the last few years and which distribute pulverized fuel either by road or rail tank wagons or in paper sacks. Mention is made also of the slight increase in the number of vehicles registered as being propelled, wholly or partly, by coal gas. The total number of such vehicles, however, is only 19, so that as yet the use of town gas for motor transport is only in the nature of a small-scale experiment, although a useful one.

Academic Qualifications

THE academic world this autumn has seen several happenings that affect the fuel industries. There has been the passing of Professor Bone; there has been the retirement of Professor Cobb; and there has been the institution of a new degree course in Fuel Technology at Sheffield University. The President of the Institute of Fuel hinted that the Institute might find it desirable to set on foot an enquiry into the most appropriate means of raising the status of the fuel technologist, and in this connexion he welcomed the introduction of courses in the subject "at more than one University." Just how far this specialization upon the one subject is desirable is uncertain. A gas engineer or chemist is a fuel technologist, and the more he knows about general fuel technology, the more valuable he will be to the Gas Industry—but is it therefore desirable that he should specialize in this subject? The fully trained technologist should have, first, a sound grounding in the scientific principles underlying his subject; generally these will consist of chemistry, physics, and mathematics, though occasionally other subjects, such as geology or biochemistry, are also important. Having obtained an adequate and sound grounding in these subjects, the student may specialize on their application to a given branch of industrial activity. This may be regarded as a counsel of perfection involving, even for those who do not fail in any examination, some five years' training. It may also be regarded as a piece of profoundly hackneyed advice, but we introduce the point in order to make two suggestions which might well be considered by the University authorities in this period of change.

Attracting New Entrants

THE increasing specialization demanded in industry, and the immensely higher standard of personal efficiency necessary to-day, demand higher training. Sir Frederick West has pointed out that the Gas Industry must pay adequate salaries in order to attract the right type of man, because if the right type of man be not attracted in sufficient quantities the Gas Industry will fall behind its competitors. Undoubtedly the salary scale and the prospects of advancement must be settled satisfactorily before any scheme for attracting men of more than average intelligence can hope to be successful. On the other side of the fence is the newly-fledged graduate who looks round to discover someone who is willing to employ him, and that is not so simple a task as many believe. Not infrequently, having spent three or four years taking his degree, he cannot afford more time and fees for whole-time study, but must take whatever is offered him. That is where industry might come in. Large firms, or (with so highly-developed an entity as the Gas Industry) an industry as a whole must be on the look-out for good men, and should be willing to do something tangible to get them.

Why should not arrangements be made for men who have taken a good general degree, and who are recommended by

their professors, to be engaged forthwith on, say, a seven-year contract agreement by industrial firms, such as large gas companies, under the special terms that for the required period of one or two years men will stay at the University at the expense of the firm, in lieu of salary, to be trained in the particular direction in which they will be useful, and which appeals to them? After that there would be five years of service at remuneration proper for a trained graduate with the firm who engaged the newly graduated student and has paid for his further education. It would depend upon the management and the conditions of service whether the men would stay on after that, but the experience of the largest gas companies seems to be that, given adequate advancement, men do not leave. This scheme need not be confined to chemists and engineers, but could apply to arts, laws, and economics also, since there are openings in industry which can best be filled by those who have these less technical qualifications. It has been said, indeed, that a training in Law is the best qualification for high position, and looking round the Gas Industry we are not disposed to deny that there may be some truth in it.

The Honours Course

OUR second suggestion is in regard to the University attitude to degrees. Is there not too great a predilection in favour of the honours course as now defined? The bright student is bidden to spend his time on the study of one subject which is taken to a development that most industrial workers never need. We are not to be understood as suggesting that the present honours course should be discontinued. There are industries and there are particular jobs in industry, and, of course, there is teaching, in which the present honours course is important and useful. In industry, however, and in the less exalted ranks of teaching, it is generally more important to have a good grasp of a wide range of subjects than a specialist's grasp of one only. For this reason, and to some extent as a basis for our first suggestion, we hold that the present "pass" degree courses should be the standard, perhaps raised a little as experience suggests to include some more advanced work. It should then be made possible to obtain either "honours" or "pass" in this general examination, according to how the student has impressed the examiners. A degree of this wider character would well fit a student for an industrial career.

Oxide Purification

We would call attention to the excellent Paper on the subject of oxide purification read by Mr. H. B. Avery at the recent meeting of the Midland Association of Gas Engineers and Managers and to be informative discussion to which it gave rise. The Paper and a full report of the discussion were published in last week's "JOURNAL." The Author mentioned the comprehensive Paper for which he was jointly responsible with Mr. R. H. Clayton and Mr. H. E. Williams in 1931 ("JOURNAL" for Nov. 4)—a Paper which has been in constant demand since then. The present contribution is of a different kind as regards length; it is, in fact, as Papers go, very brief. But it is packed with useful advice on the efficient and successful operation of oxide purification plant. Mr. Avery set out the three most likely causes of failure and unsatisfactory working as inadequate oxygen content of the gas, excessive ammonia content, and inadequate ammonia content. Wherever possible, daily tests on the oxygen content of the purified and also the unpurified gas should be made; and in this connexion it was pointed out in the Paper that observations of the temperatures are also a very useful indication in this respect, as an otherwise unexplained decrease in the average working temperatures may be due to a shortage of the oxygen supply. Concentrations of oxygen of below 0·3% are practically inoperative and may be discounted, and a sufficient concentration in excess of the theoretical quantity required for the main reaction must be allowed to cover side reactions. As for ammonia, this should be present to the extent of 4 to 5 grains, and concentrations viewed with suspicion. The points dealt with by Mr. Avery cover the most common causes of difficulties to be met with in oxide purification; and when once appreciated they are simple, easy to overcome, and the testing involved in ensuring their control not by any means excessive.

Forthcoming Engagements

October.

27.—B.C.G.A.—Midland District Conference at Shrewsbury.

27.—Coke Oven Managers' Association.—Annual Dinner, Hotel Victoria, Northumberland Avenue, London.

27.—I.G.E. and S.B.G.I.—Ad Hoc Joint Committee on Research, Gas Industry House, 2.30 p.m.

28.—B.C.G.A.—South Wales District Conference at Cardiff.

31.—L.C.C.A.—Executive Committee, 11 a.m.; Central Committee, 12 noon; Annual Luncheon, May Fair Hotel, 1 p.m.; Annual General Meeting, 3 p.m.

November.

1.—I.G.E.—Council, The Institution of Mechanical Engineers, 9.30 a.m.; Council (continued), the Institution of Mechanical Engineers, 4.30 p.m.

1-2.—I.G.E.—10th AUTUMN RESEARCH MEETING at the Institution of Mechanical Engineers, Storey's Gate, St. James's Park, London, S.W. 1.

3.—Midland Juniors.—Paper by A. V. Wainwright on "The Remote Control of a District Gasholder."

3.—S.B.G.I.—Autumn General Meeting, May Fair Hotel, W. 1. Council Meeting at 56, Victoria Street, S.W. 1, 11 a.m.

4.—B.C.G.A.—Executive Committee, 11.30 a.m.

5.—Scottish Eastern Juniors.—Tour of Works in Edinburgh Using Town Gas for Industrial Purposes.

8.—London and Southern Juniors.—Discussion on "Technical Education in the Gas Industry," introduced by Dr. J. N. Long.

12.—Scottish Western Juniors.—Address by W. R. Drummond on "The Work of the National Gas Organizations in Scotland."

16.—Southern Association (Eastern District).—Meeting at Gas Industry House, 2.30 p.m. Paper on "Framing a Sales Policy from Market Research."

17.—Midland Juniors.—Visit to John Harper & Co., Ltd., Willenhall.

18.—I.G.E.—Session at Public Health Exhibition, Agricultural Hall, Islington, 3 p.m.

18.—North of England (Auxiliary) Association.—Half-yearly Meeting at Newcastle-upon-Tyne, 2.30 p.m. Paper by J. S. Merry on "Boiler Water Problems."

19.—Western Juniors.—Visit to Portishead Generating Station, Bristol. Paper by H. C. Widlake, of Plymouth.

25.—London and Southern Juniors.—Annual Dinner and Concert, Empire Restaurant, Victoria, S.W. 1.

25.—Southern Association.—General Meeting, Hotel Victoria, Northumberland Avenue, W.C. 2, 2.15 p.m. Paper by S. F. Dunkley on "Quality Control and a System in Operation." Committee Meeting, 11.45 a.m.

26.—Scottish Western Juniors.—Visit to Greenock Corporation Gas Department.

(There will be no meeting of the Central Executive Board of the National Gas Council or of the Central Committee of the Federation of Gas Employers during the Month of November.)

December.

13.—N.G.C.—Central Executive Board, 2.30 p.m.

Letters to the Editor

Calorific Values of Gas

SIR,—The time is indeed at hand for the question to be considered which you have so topically introduced. My view is that there is no need for more than ONE calorific value for town gas—The Best!

Of course it cannot be expected that the Gas Industry, conservative as it is, will at once swallow and adopt the suggestion that Mr. Blundell has made for 500, 475, 450, 425, and 400, although it is so well backed up by the writers for the most influential gas paper in the world. Who are these writers and what is their occupation in addition to writing? I should like to know more of their activities if it is not a secret.

What many of your readers are anxious to know are the reasons at the back of the suggestions, and the experience of those making them, in the use of the other qualities they are seeking to taboo.

My fighting capacity is not so good as it was, but if you will arrange a platform for all advocates you can muster for the suggestions you make—after the above questions have been answered—I am prepared to meet them and what evidence or even arguments they can bring with them—alone.

Yours, &c.,
GEORGE HELPS.

Queen's Road,
Nuneaton,
Oct. 22, 1938.

[For Mr. Helps' information the writer of the articles in question is a member of the "JOURNAL" staff. In addition to writing, his only occupation is to keep closely in touch with developments in the Gas and kindred fuel industries.

Who will do battle with the champion of 200 c.v. gas? We should be delighted to provide the ring and all the necessary appurtenances.—ED., G.J.]

Production of Active Carbon

SIR,—In your issue of Sept. 7 readers were told that "active carbon of a high quality required in large quantities for gas masks and for a number of industrial processes can now be produced in this country from graded lump coal."

No doubt your readers formed the opinion that this was something new in chemical processes. As a matter of fact the production of activated carbon from graded coal has been carried out commercially at the works of Sutcliffe, Speakman, & Co., Leigh, Lancs., since 1923. This firm have so developed the technique of activated carbon manufacture that their plants produce charcoal adsorbents from coal, briquette coal, and nutshells, at one and the same time.

Yours, &c.,
F. HOWARD.

19, *Brookfield Street,*
Leigh,
Oct. 18, 1938.

[Our correspondent was referring to a summary of Fuel Research Technical Paper No. 47, "The Production of Active Carbon from Bituminous Coal," on p. 580 of the "JOURNAL" for Sept. 7. The results outlined were of an investigation carried out jointly by the Fuel Research organization of the Department of Scientific and Industrial Research and the Chemical Defence Research Department.—ED., "G.J."]

Personal

Mr. WILLIAM DE PRELAZ CROUSAZ, O.B.E., who has been Chairman of the Guernsey Gas Light Company, Ltd., continuously since 1908, has retired from that position, and his place has been filled by Mr. QUERTIER LE PELLEY, who for some years has been the Vice-Chairman. Mr. Henry W. CROUSAZ, the younger son of Mr. William de Prelaz Crousaz, has been elected to fill the vacancy on the Board caused by the retirement of his father.

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At a recent meeting of the Bangor (Co. Down) Borough Council Councillor Logan, Chairman of the Gas Committee, reported with reference to the previously expressed desire of the Gas Manager, Mr. B. MITCHELL to retire as from April 1 next, that he had been unable to persuade Mr. Mitchell to reconsider his decision. Mr. Mitchell, who expressed his deep appreciation of the Council's request, had stated that he would be quite willing, on retirement, to give advice and assistance, if required, without remuneration. Councillor Logan spoke in terms of warm appreciation of Mr. Mitchell's services since he became Manager of the Gas Undertaking thirty-eight years ago.

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Mr. GEORGE BERNARD FIDDES, Assistant Engineer to the City of Leicester Gas Department, retired under the Superannuation Scheme on Oct. 18 after 37 years' service with the Leicester Corporation. He was the recipient of gifts from the Engineer and Staff, and from the employees at Aylestone Road Works. His successor to the position of Assistant Engineer is Mr. EDWARD PERCIVAL WOODS, who has been with the Department since March, 1923.

Obituary

Councillor JOHN WILLIAM FORD, one of Bolsover's best-known public men, passed away at his home, the Gas-Works House, Bolsover, on Oct. 16, at the age of 65. Mr. Ford had been in Bolsover for over 25 years, coming from Hull to be Manager to the Bolsover Gas Light and Coke Company, Ltd., a position he held up to the time of his death. He was first elected to the Bolsover U.D.C. in 1923, of which he subsequently became Chairman. Mr. Ford was a member of the Hardwick Lodge of Freemasons, Chesterfield.

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The death occurred on Friday, Oct. 14, in a Bridgwater nursing home, after an illness lasting several months, of Mr. MATTHEW MOSSMAN, of Sea View Terrace, Watchet, who since 1923 had been associated with the Watchet and Williton Gas Company, being Chairman for the last four years.

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Mr. FRANCIS HALL, J.P., a Director of the Dollar Gas Company, has died in his ninetieth year.

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The Directors of the Andover Lighting and Power Company regret to report the death of Mr. GARNETT T. TEMBLETT, Managing Director of the Company, on Monday, Oct. 17. The funeral took place at Andover Parish Church on Oct. 20.

Amalgamation and Grouping

United Kingdom and Ellesmere Port.

The United Kingdom Gas Corporation, Ltd., has offered £120,000 for the Ellesmere Port U.D.C. Gas Undertaking.

This offer was debated at a recent meeting of the Council and was accepted. During discussion it was stated that had the sale been made twelve months ago, the Council would have obtained a better price. Reasons for selling the undertaking were: (1) The Corporation, when it acquired the Undertaking on April 1 next, would be able to give immediate concessions to consumers; (2) ratepayers would be relieved, after the end of the present financial year, from subsidizing the Undertaking; (3) cheaper gas would be available for street lighting purposes; and (4) outstanding liabilities would be met.

Women's Gas Council

Two New Branches in East London.

At the beginning of the month a new branch of the W.G.C. was formed in the Lea Bridge district at Walthamstow when 134 members joined. The meeting was presided over by Mr. D. C. Cross, Engineer and General Manager of the Lea Bridge District Gas Company; and Miss Halpin, Organizing Secretary of the Women's Gas Council, addressed the meeting on the aims and objects of the Council and the work it was doing throughout the country. Miss Goggin, Secretary of the Poplar Branch, told the meeting how a branch was run and outlined some of the activities of her members.

Last Thursday another branch was formed at Bow, when Miss Halpin addressed a large meeting of prospective members presided over by Mr. C. W. Lawrence, Chief of Gas Sales Department, of the Commercial Gas Company. This last branch has been necessitated by the rapid development of the Poplar Branch which has outgrown its accommodation.

Exhibit at Woman's Fair.

The Women's Gas Council Day at the Woman's Fair at Olympia will be on Wednesday, Nov. 23.

The W.G.C. exhibit will consist of a literature and information bureau in the Hall of Achievement, and a stand in the Mothercraft Section which will depict the Gas Industry as a career for girls. The Kitchen in this latter exhibit will be designed by Mrs. Darcy Braddell.

Address by Dowager Marchioness of Reading.

A meeting of the Women's Gas Council was arranged at Gas Industry House last Monday afternoon, when an interesting address was given by the Dowager Marchioness of Reading, Chairman of Women's Voluntary Services.

News of the Week

In the Five-Year Plan of Thornton-Cleveleys District Council is the expenditure of £32,925 on the development of the gas undertaking.

Copies of the Following Recent British Standards may be obtained, price 2s. each, from the Secretary, The Institution of Gas Engineers, 1, Grosvenor Place, S.W. 1.: No. 515-1938.—Carbolic Acids "60's" (Superseding No. 515-1933); No. 517-1938.—Cresylic Acid of High Orthocresol Content (Superseding No. 517-1933); No. 521-1938.—Cresylic Acid (Superseding No. 521-1933); No. 522-1938.—Orthocresol, Metacresol, and Paracresol (Superseding No. 522-1933); No. 523-1938.—Phenol (Superseding No. 523-1933); and No. 78-1938.—Cast-Iron Pipes (Vertically Cast) for Water, Gas, and Sewage, and Special Castings for Use Therewith.

Nearly Ten Thousand People attended the recent Cooking and Beauty Demonstrations and Exhibition of Gas Appliances organized by the Burnley Gas Department. On two occasions the hall was filled to capacity by some 900 visitors; one of these occasions was the opening day, at which the Cotton Queen of Britain performed the ceremony. The programme was a varied one, including demonstrations, lectures, health talks, and films, while a cake baking competition attracted 90 entries. The Burnley Gas Department are to be congratulated not only on the success of their efforts to link up gas with health, but also on the greatly increased sales of gas appliances which has followed.

When a Quantity of Old Documents were being sorted out from the basements of Salford Town Hall recently, there was found a receipt for the gas lighting of the police headquarters dated June 24, 1830. It was made out to "The constables of Salford." The charge for a quarter's gas was £1 5s. 6d. How much gas was consumed for that sum was not indicated, for at that date the Salford Patent Gas Light Company charged its consumers according to the number of jets in use. Furthermore, the jets being supposed to be burned at certain hours the receipt contains the printed warning: "The Gas Light Company, having been apprized that many persons burn their lights much beyond the time which the lighting is contracted for, have found it necessary to appoint an inspector for the purpose of giving information. You are therefore hereby required to observe that if you shall be found burning your lights beyond the time of —o'clock" (the time is not filled in)—"you will, after notice shall have been given you, be considered as burning your lights extra, and will in future be charged accordingly. A further charge will be made if found burning on Sunday evenings."

An Exhibition of Gas Appliances by the Stirling Gas Light Company is being staged in Millars' Ballroom all this week. Cookery demonstrations are being given in the afternoons and evenings by Miss D. M. Gillham, B.P.T.C., and the Exhibition was opened by Mr. R. Keith Common, Chairman of the Company.

The Single-Lift Gasholder at the Loughborough Gas-Works is being replaced by a three-lift spiral holder, increasing the capacity from 120,000 cu.ft. to 500,000 cu.ft., at a cost of £11,500. It is estimated that the work will be completed in about seven months, and the total storage capacity of the holders, including the two at Quorn, will then be 1,300,000 cu.ft.

Miss Anna Neagle, the famous film star, visited the Gas Pavilion during her tour of the Empire Exhibition at Glasgow on Oct. 18. She was accompanied by Mr. Herbert Wilcox, the producer. Miss Neagle showed great interest in the cookery demonstrations given by Miss Sketchley, of Allied Ironfounders, Ltd., and accepted a cake baked by Miss Sketchley.

Members of The Institution of Gas Engineers will be welcome at a meeting of the Junior Institution of Engineers to be held at 39, Victoria Street, S.W. 1, on Oct. 28, at 7.30 p.m. A Paper will be read by Dr. Herbert Chatley, M.Inst.C.E., on "The Status, Qualifications, and Remuneration of the Engineer." Tickets can be obtained from the Secretary of the Institution of Gas Engineers.

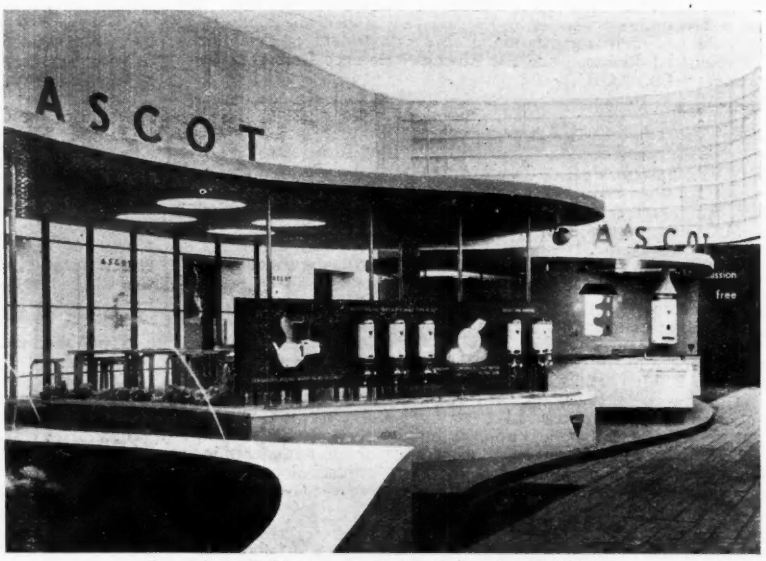
Christmas Fare Cooking Demonstrations, including the use of gas refrigerators, have been arranged by the Leamington Priors Gas Company to commence early next month. The cookery demonstrator will be Miss M. Harris, N.T.S.C., M.C.A., of Sidney Flavel & Co., Ltd., while the refrigerator demonstrations will be in the hands of Mrs. Margaret Tew, of Electrolux, Ltd. A Christmas Shortbread Competition will be a feature of the programme.

A Very Successful Series of gas cookery demonstrations and an exhibition of gas appliances was held recently by the Barnstaple Gas Company in conjunction with Radiation, Ltd., at the Foresters Hall, Barnstaple. These demonstrations, given by Miss R. Gilmour, of the Radiation Research Kitchen, on "New World" cookers created much interest and the average attendance was over 100 people at each session. A cake-baking competition proved very popular and over 60 entries were received, the judging for the prizes being a difficult task. The efforts of the Barnstaple Gas Company, under the supervision of Mr. J. H. Lowther, Managing Director, were well rewarded by the success of this exhibition.

B.C.G.A. South Wales District

Meeting at Cardiff

A meeting of members of the British Commercial Gas Association in the South Wales District will be held in the lecture room of the showrooms of the Cardiff Gas Light and Coke Company on Friday, Oct. 28. Members will assemble at 11 a.m., when there will be a private discussion on the Association's smoke abatement campaign and on the Association's work. At 1 p.m. luncheon, by invitation, will be held at the Whitehall Rooms, Park Hotel. At 2.45 p.m. there will be a performance of the new season's programme of Gas Industry Films in the Lecture Theatre, South Wales Institute of Engineers, Park Place. The meeting is timed to conclude about 4.15 p.m.



The "Ascot" Display at the North London Exhibition.

"Joy of Living"

The accompanying photograph illustrates an ingenious link-up between gas and a film entitled "Joy of Living" arranged in the showroom of the Swansea Gas Light Company—using the Heinz slogan which is the same as the title of the film. The display created a great deal of interest, and the local paper reproduced this photograph in a recent issue.

The Importance of Purchasing

The legend of the fearsome buyer was effectively disproved by the Purchasing Officers' Association at the annual dinner of the London Branch held recently. Mr. D. W. Turner, Director of Wrights Ropes, Ltd., who was the principal guest, said that undoubtedly there had for many years been an assumption that no especial knowledge or technique was needed for purchasing, but to the intelligent observer such an attitude was obviously wrong. There was, in fact, no limit to the knowledge required by the purchasing officer to perform his job in the scientific manner which was demanded by modern industry. The present-day purchasing department was a highly organized unit and in a very few years the status of the department and of the individual buyer had risen enormously.

Mr. H. M. Close, Stores Buyer of the Gas Light and Coke Company and Chairman of the London Branch of the Association, said that he had had a long career as a purchasing officer, and during that time had witnessed many changes in the practice and technique of purchasing, and he felt sure that the Association would go far as a professional body of the first importance.

New Holder Inaugurated at Burnley

The Burnley Corporation Gas Department last week put into commission a new spiral-guided gasholder at the Stoneyholme Works. At the ceremony of opening the valve, Mr. W. T. Kitching, General Manager of Newton Chambers & Co., Ltd., the contractors, said this gasholder was the first of its type constructed in Burnley. It would not tilt under wind pressure, it could be much more easily painted, and would not be as conspicuous as the old type, as it would disappear below the ground when it was empty. The holder, he said, was 20% cheaper than the old type. In its construction 450 tons of steel, 200,000 rivets, and five miles of canvas jointing tape had been used.

Councillor Yates revived the idea of a gas grid for the north-east Lancashire towns. A few years ago, he said, some members of the Gas Committee had a scheme for supplying gas to the area embracing Padiham, Nelson, and Colne. Under that scheme Burnley would have supplied neighbouring towns and the rural area with cheaper gas. Personally, he thought it would have been one of the finest things that could have happened, and would have been an example of real municipal administration.

Centenary Celebrations at Andover

On Oct. 15 exactly one hundred years ago, following a public dinner at the George Inn, the Mayor of Andover, Mr. Thomas Heath, lit the first gas street lamp in the town and so began the service of one of the most progressive companies in the town to-day—the Andover Lighting and Power Company.

The Company marked its centenary with an exhibition and demonstrations at the Guildhall of modern gas appliances, and the week of celebrations was inaugurated by a meeting at the New Theatre, when a review of the Company was given by Mr. W. P. Clarke (Chairman of the Directors), and an interesting Address on the relations of the Gas Industry to the health of the nation was given by Sir Percy Alden, M.A., followed by films.

Mr. Clarke presided, and he was supported by Sir Percy Alden, the Mayor of Andover (Mr. R. B. C. Kendall), the Mayor-elect (Mr. W. J. Armstead), and Messrs. F. H. Sherwood, A. J. Holmes, and J. Oram (Directors of the Company).

Mr. Clarke outlined the history of the Company, and following Sir Percy Alden's Address shareholders and others were entertained at tea at the Guildhall. As an indication of the remarkable growth of the undertaking, it may be mentioned that the output of gas has grown from less than 5½ million cu.ft. in 1875 to nearly 40 millions in 1920 and to over 77 millions last year.

The result of the Exhibition, a section of which is illustrated in the accompanying photograph, was highly satisfactory, almost a thousand people attending during the week. A cake-baking competition arranged in conjunction with the cookery demonstrations brought in 106 entries. At the final session prizes consisting of sink water heaters, portable heaters, and cooker lighters were presented by the two demonstrators, Mrs. H. S. Lunn, M.C.A., of R. & A. Main, Ltd., and Miss E. Sanderson, First-Class *Diplomée* N.T.S.C., of the Radiation Research Kitchen.

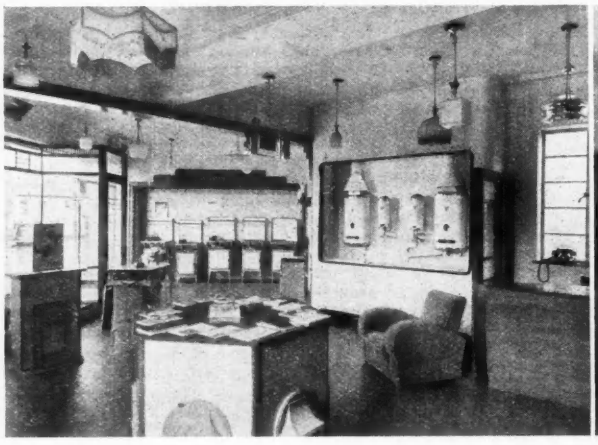
These two ladies were presented with handbags on behalf of the Company, and Mr. W. P. Clarke thanked them for distributing the prizes, and also expressed gratitude to the representatives of the two firms co-operating in the exhibition. He concluded with a word of thanks and praise to Mr. F. C. Colebrook (Fittings Superintendent) and the staff for organizing and running the exhibition so efficiently, and Mr. Colebrook, in a brief reply, said that if the public had been satisfied with the Exhibition and had enjoyed the cookery demonstrations, the Andover Lighting and Power Company would feel that their efforts had met with ample success.

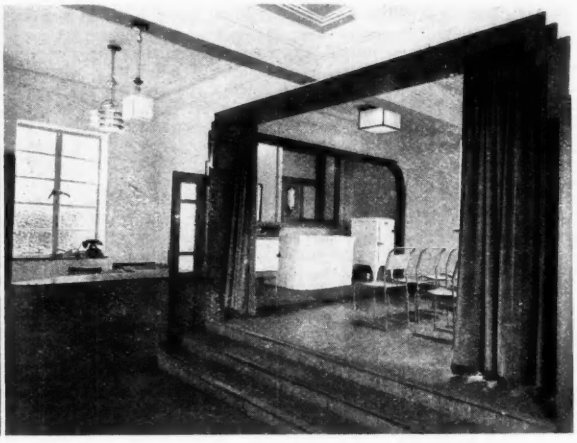
Barnstaple Company Open Branch Showrooms

AT

Braunton

Attractive new branch showrooms have lately been opened by the Barnstaple Gas Company at Braunton. Three views of the premises are reproduced in the accompanying illustrations, that on the left being a photograph of the exterior by night.





"May We Help You?"

Newcastle Asks 500 Women's Associations

A rather refreshing angle on home service activity is provided by the Newcastle-upon-Tyne and Gateshead Gas Company, who are sending copies of a new booklet entitled "May We Help You?" to five hundred women's associations. A covering letter sent with two copies of the booklet tells the particular association that the Company trusts that the booklet will assist them in the task of compiling their syllabus for the coming autumn and winter sessions. The letter goes on to say how much the Company appreciated visits paid to their demonstration theatre by various women's organizations in their area, and express the hope that the extension of their home service activities, as described in the booklet, will result in closer and more frequent contact between the particular association addressed and the Company.

The booklet appeals to one immediately. Printed on art paper in bold and tastefully varied type the matter is very readable and is sure to "hit the mark." The opening paragraphs set out the aim of the Company to be of real service to the thousands supplied, adding that it is pleasing to reflect that during the past decade their home service work has earned the warm appreciation of the many women's organizations in the Newcastle area. The Company pays tribute to the keen desire exhibited by North Country women in devoting their leisure towards acquiring knowledge in modern homecraft, and with the object of further assisting in the educational activities of women's associations, the Company point out that they have arranged to extend considerably the scope of their home service activities so that every aspect of modern home management is effectively catered for.

Among the great diversity of subjects which form the subject of demonstrations, talks, and films are cookery, menu planning, dietetics, food preservation, health, homecraft, home laundry, kitchen planning, special courses, colour schemes, sweet making, and icing and decorating.

London and Southern Juniors

Visit to Pyrene Works

An interesting visit was paid by over forty members of the London and Southern District Junior Gas Association on Oct. 19 to the Brentford Works of the Pyrene Company, Ltd., when demonstrations were given of fire-fighting by means of "Pyrene" extinguishers. Petrol and other inflammable materials were ignited under various conditions and the resulting fires quickly put out.

Chemical extinguishers of various kinds were also shown in action, together with the application of foam. A modification of the latter is an automatic extinguisher actuated by a fusible link or water control head. The "Pyrene" hose reel was demonstrated; this occupies little space and can be drawn off in any desired direction.

Following the inspection of the works, the members paid a visit to the North London Exhibition at the Alexandra Palace, where they had the opportunity of seeing the fine "Gas Fair" arranged by the Tottenham and District Gas Company and leading manufacturers of gas appliances.

Women's Fair, Olympia

This Exhibition will be held at Olympia from Nov. 2 to 26 and is being organized on the same extensive scale as the Ideal Home Exhibition.

In view of the Fair's probable wide appeal, the British Gas Federation has considered it advisable to be represented, and arrangements are in hand for suitable exhibits which will include Smoke Abatement publicity, combined Cookery Demonstrations and Film Displays and a prestige display of the domestic uses of gas.

"Health Week" at Southport

Home Service Exhibition

The Southport Home Service Exhibition, with demonstrations and talks—the first exhibition to be held in the Floral Hall annexe—was opened on Oct. 17 by Colonel W. Moncrieff Carr, O.B.E., T.D., Managing Director of the United Kingdom Gas Corporation, Ltd.

As evidence of the interest aroused by the exhibition, it may be mentioned that a great many people were turned away because the annexe was already packed to capacity for the opening.

This exhibition, although based on the advantages of the use of gas, was, to quote one of the speakers at the opening ceremony, more in the nature of "a health week," and among the attractions for the week (the exhibition concluded last Saturday) were films of both popular and an instructive nature, cookery demonstrations by Miss M. Whittington, of the Radiation Research Kitchen, health talks by Mr. T. Bowen Partington, F.I.L., F.R.E.S., demonstrations of health exercises by Southport members of the Women's League of Health and Beauty, talks on kitchen planning by Miss M. A. Rowe, of the Kitchen Planning Centre, London, demonstrations of facial beauty treatment by Madame Josephine, of Hollywood, home laundry demonstrations and water heating displays. In addition to this there was an extensive and interesting display of different appliances.

Councillor H. W. Barber (Deputy Mayor) presided at the opening ceremony, and was supported, in addition to Colonel Carr, by Councillor W. Lea (Chairman of the Gas Committee), Councillor W. Houldsworth (Vice-Chairman), Mr. J. H. Clegg (Engineer and Manager), Officials of the Gas Undertaking, and members of the Town Council.

At the opening of the Exhibition, left to right, Councillor Dr. F. H. Betteridge, Councillor Mrs. Leigh, Councillor and Mrs. A. E. Wycherley, Councillor H. W. Barber (Deputy Mayor) and Mrs. Barber, Colonel W. M. Carr, Mrs. Clegg, Mr. J. H. Clegg, and Mrs. Gilbert.

Councillor Barber said he thought the large audience was a good augury for a successful week. He congratulated the Gas Committee and Mr. J. H. Clegg on staging such an excellent exhibition, thereby enabling consumers to see for themselves the latest developments in gas appliances. He had been greatly impressed with the sales campaign of the Undertaking. Councillor Barber went on to extend a welcome to Colonel Carr. He was, he said, a leading gas expert. He had local connexions, for before the war he was Engineer and Manager of the Ormskirk District Gas Company. His presence was a compliment to the Gas Committee and Mr. Clegg.

Before declaring the exhibition open, Colonel Carr said that he was not altogether a disinterested visitor because some of the Companies controlled by the United Kingdom Gas Corporation, Ltd., were very close to Southport, and he recognized some of the people present as coming from areas where he used to work, including Ormskirk, Leyland, and Prescot. The United Kingdom Gas Corporation was endeavouring to do what the exhibition symbolized—improve service. Colonel Carr then declared the exhibition open.

Councillor W. Lea proposed a vote of thanks to Councillor Barber and Colonel Carr, which was seconded by Councillor W. Houldsworth.

Mr. T. Bowen Partington, who is acting as *compère* for the exhibition, said the exhibition was above the standard of an ordinary demonstration of gas appliances. It was being made into a health week generally. The Gas Industry was synonymous with health.

Scottish Building Centre Opened

The official opening of the Scottish Building Centre in Sauchiehall Street, Glasgow, was performed on Oct. 21 by Mr. H. J. Scrymgeour Wedderburn, D.L., M.P., Under-Secretary of State for Scotland.

Colonel G. Gardner-McLean, Chairman of the Centre, who presided, said that the Centre would permanently exhibit materials and fittings in connexion with housing. It would also supply skilled technical information to those who wished it.

Mr. Scrymgeour Wedderburn said that nearly 300,000 working-class homes had been built since the war, but another 250,000 were needed. Slums and overcrowding could only be cured if we departed from traditional building methods. The Department of Health had been bringing to the notice of local authorities the fact that timber houses, which were equal in durability and appearance to other houses, could be built rapidly. They should be bold and imaginative in improving the present housing amenities.

The Scottish Building Centre has a basement, which houses fireplaces; a ground floor, with baths and fittings; a first floor, where there is a display of gas and electrical appliances; and a second floor, where timber is shown.

Ascot Gas Water Heaters, Ltd., have taken space for a permanent display on the first floor, and it is expected that the British Gas Federation will also be exhibiting.

The Centre will be managed by Mr. I. S. M. Lang.

Eastern Counties Gas Engineers' and Managers' Association

The Autumn General Meeting of the Eastern Counties Gas Engineers' and Managers' Association was held at Gas Industry House, S.W.1, on Thursday, Oct. 20—Mr. W. C. CHAPMAN (Boston), the President, in the Chair.

The minutes of the last General Meeting, as published in the Technical Press, were confirmed, after which apologies for absence were reported from officers of kindred associations and from members.

A Paper entitled "Keeping Ahead at Ipswich" was read by Mr. W. J. C. Garrard, A.M.Inst.C.E., of that Company. This, together with a report of the discussion which followed, will be dealt with in a subsequent issue.

Officers for the ensuing year were then elected as follows:

President.—J. Kennington (Grimsby).

Vice-President.—F. H. Robinson (Bishops Stortford).

Hon. Secretary and Treasurer.—H. H. Redwood (Newmarket).

Auditors.—G. A. Mallett (Ipswich) and J. H. Troughton (Newmarket).

New Members of Committee.—C. B. Staniforth (Ely) and L. C. B. Williams (Thetford).

Education Secretary.—E. F. Keable (Great Yarmouth).

On the proposition of Mr. WALMSLEY, seconded by Mr. J. E. YOUNG (Grantham), the PRESIDENT (Mr. W. C. Chapman) was unanimously elected to serve as the Association's representative on the Council of The Institution of Gas Engineers.

The PRESIDENT reported that there had been no calls on the President's Benevolent Fund during the year.

Mr. W. H. WINTRINGHAM (Chairman of the Great Grimsby Gas Company) extended to the members of the Association and their ladies a cordial invitation to visit Grimsby for their meeting next May. His Company was very desirous that a good muster should be present—representative of the whole of the Eastern Counties—and they would do their best to entertain them and make their visit an enjoyable one. The Grimsby Company were very pleased that the Association had elected Col. Kennington as their President.

Midland Association

With reference to our report of the Autumn General Meeting of the Midland Association of Gas Engineers and Managers in the "JOURNAL" for Oct. 19, it was stated that Mr. O. S. Brettle was elected to membership of the Association.

Actually it was his father, Mr. Joseph Brettle (late Engineer and Manager of the Sedgley Urban District Gas Department), who was elected to Hon. Membership.

The Annual General Meeting

OF THE

British Commercial Gas Association

Owing to the unfortunate necessity for abandoning, for the time being, the arrangements made for the Annual General Meeting at Brighton this year, as the result of the international crisis, the British Commercial Gas Association held its Twenty-Seventh Annual General Meeting on Tuesday, Oct. 18, at the Dorchester Hotel, Park Lane, W. 1, under the Presidency of Mr. A. M. PADDON, M.Inst.C.E., who was re-elected for a second period of office, and who has renewed the invitation to the Association to visit Brighton next year.

After the conclusion of the formal proceedings, there was a display of publicity films; a luncheon, attended by the Rt. Hon. Walter E. Elliot, M.C., M.P. (Minister of Health), the Rt. Hon. Herbert Morrison, M.P. (Leader of the London County Council), and many other distinguished guests and members of the Gas Industry; and a private meeting at which the Association's publicity programme for the coming year was discussed.

Following the opening of the meeting by the President, Mr. W. J. SANDEMAN, J.P. (Executive Chairman), moved the adoption of the 27th Annual Report. Before doing so he said how greatly they appreciated Mr. Paddon's acceptance of the Presidency for a further period and the renewal of the invitation of his Company (the Brighton, Hove, and Worthing Gas Company) to hold their next Annual Meeting at Brighton. The date of this meeting was not yet fixed, but it would probably be in April next.

Continuing, Mr. Sandeman said it had been a source of great regret to him that, through ill-health, his year of office had not been as complete as he desired, and he thanked Major Bywater and others who had so successfully carried on for him during his absence.

To-day every gas undertaking had accepted publicity and propaganda as an essential feature of sales promotion activities. With the growing tendency to the appointment of publicity officers by gas undertakings, these questions were becoming more clearly understood, and while more and more members were preparing and running their local advertising campaigns, there was greater need than ever for the Association's national work. The proposed new constitution for the Association under the British Gas Federation, which was referred to in the Report, and which had been generally approved in principle, would give members district organizations which should go a long way towards strengthening the Association and keeping headquarters more closely in touch with the needs of the district. Mr. Sandeman concluded by acknowledging the help he had received during his year of office from Mr. Rowe, Mr. Lucas, and the staff.

Alderman E. GRIMSLEY, J.P. (Leicester) seconded the resolution for the adoption of the Report. He congratulated Mr. Paddon on having been re-elected to a further period of office. In the ordinary course of events, the honour would have fallen to them at Leicester; and as Chairman of the Leicester City Gas Department, he said they in Leicester would regard it as a privilege in the future to make the necessary arrangements for the reception and comfort of delegates to the Association.

The Accounts.

In the absence of the Hon. Treasurer of the Association, Mr. T. P. Ridley, Mr. STEPHEN LACEY (Chairman of the Finance Sub-Committee) presented the Association's Accounts for the year ended March 31, 1938. It was, he said, a pleasant task because the income of the Association was larger than that of the previous year, thus reflecting the increasing value of the Association to the Industry; and he reminded them that contributions to the national bodies on the full basis per million cu.ft. represented 92·7% of the total volume of gas made in the country. At the same time the income of the Association was still relatively small by comparison with the amounts spent on publicity by the great national advertisers, and in relation to the competition they had to meet.

Alderman W. J. CROOKES (Doncaster) seconded the resolution.

President's Remarks.

The PRESIDENT said that one thing which had impressed him very strongly was that, whenever the policy and the efforts of the Association had been concentrated on one particular point, the immediate result had been rather remarkable, but the aftermath had been rather disappointing. He was referring particularly to the campaign in relation to gas fires. He personally did not think at first that the results of that campaign would prove to be of a very remarkably accentuated character; but they were, and it was astounding how the use of gas fires was promoted by the special attention given to them by the Association. But when they came to consider the succeeding period it was equally marked how sales of gas fires had fallen off when they were no longer receiving this special treatment by the Association.

There was a moral in that, for what applied to gas fires would apply to hot water and to all those special branches of their commercial activities to which the Association devoted its particular attention. A hot water campaign was in prospect and, therefore, they might expect a remarkable result in that direction; but they must be prepared, when that special effort had been made, to get a little discount on their efforts to succeed it.

In the immediate future one of the subjects most prominently before them would be that of smoke abatement. It would not be of the same specific nature as was the appeal for the use of fires, and they must look for a more remote and more general effect in the future than they could attribute to the initial effort.

Publicity Films.

Five films introduced by Mr. Baird were displayed, and the meeting adjourned for luncheon.

LUNCHEON SPEECHES.

The Right Hon. WALTER E. ELLIOT, M.C., M.P. (Minister of Health), proposing "The Gas Industry," said the Gas Industry in itself was a romance. It treated 18 million tons of coal every year, producing two smokeless fuels, gas and coke, which pointed the way towards the day when all their cities would be as smokeless as the cities of ancient Greece. The Gas Industry had a double interest for the Minister of Health. First, it had always been closely associated with Local Government bodies and with Parliament; secondly, from another angle altogether, any Minister of Health must be keenly interested in the processing of one of their great home produced raw materials, so as to extract from it wealth, and to make it a beautifying instead of an uglifying agent in the modern landscape, and in their daily life. The Gas Industry seemed to him to personify two most novel and interesting tendencies. Its component parts were great public utilities or local authorities, representing the co-operation of all engaged in the Industry. In addition, it appeared as a sort of Arabian Nights entertainment which, not content with inventing and popularizing that beneficent sprite, Mr. Therm, had now embarked upon the new series of publicity activities of which the films they had seen that morning were examples.

Continuing, Mr. Elliot said he was intensely interested in the

experiment at Kensal House. There, he was told, the average expenditure for a complete fuel service, thoroughly adequate by good standards, was 4s. 6d. per week, which compared with the sum of over 6s. per week which the average London working-class family would have to spend for similar services.

From many points of view, concluded Mr. Elliot, the Gas Industry was a pioneer industry, a pioneer in a new technique, and for that as well as for its work as a great British commercial undertaking, he was very glad to be with them that day.

Sir DAVID MILNE-WATSON, Bart., LL.D. (President of the National Gas Council and Chairman of Council of the British Gas Federation), responding to the toast, voiced their great appreciation of the fact that the Minister of Health had delivered so very encouraging and kindly a speech. Mr. Elliot had spoken of the Gas Industry as a pioneer industry, and that was certainly true. Now their battle cry was "Smoke abatement," to reduce the number of hours of light and sunshine that were lost in this country as the result of smoke and fog. They could not alter the fact that they lived in a marshy sea-girt island, but they could do a very great deal to take away the menace of smoke and pollution from the air. They were doing away with, or helping to do away with a great loss of money and a great loss of health. But there was another problem they were anxious to tackle to-day and that was the problem of food. The Gas Industry was fully justified, he thought, in carrying on a campaign in England, Scotland, Ireland, and Wales on this question of nutrition. It was no use having food if they did not cook it properly, and if they supplied the material with which food was cooked, they were justified in taking their responsibilities very seriously. Therefore, they were producing films and were arranging lectures on questions of dietary.

"The People's Food."

Sir William Crawford had recently published, in a book entitled "The People's Food," a striking study of the national problem of diet and nutrition. In this it was shown by expert enquiry that defects in the diet of many of our people were due only in part to lack of the wherewithal to provide adequate menus. Sir William Crawford's researches indicated that anything from 12 million to 22 million people in this country were members of households where enough money was spent on food to provide, if it were spent to the best advantage, the minimum diet necessary for health. But the researches also made it clear that in these households the money was not in fact laid out to the full theoretical advantage, and family health suffered in consequence. Now the Gas Industry, as the nation's chief cook, was making positive and increasingly effective use of its great organization to assist in the education of housewives in the simple fundamentals of proper diet and in the best methods of choosing and treating food. They must not make the mistake of over-simplifying the problem.

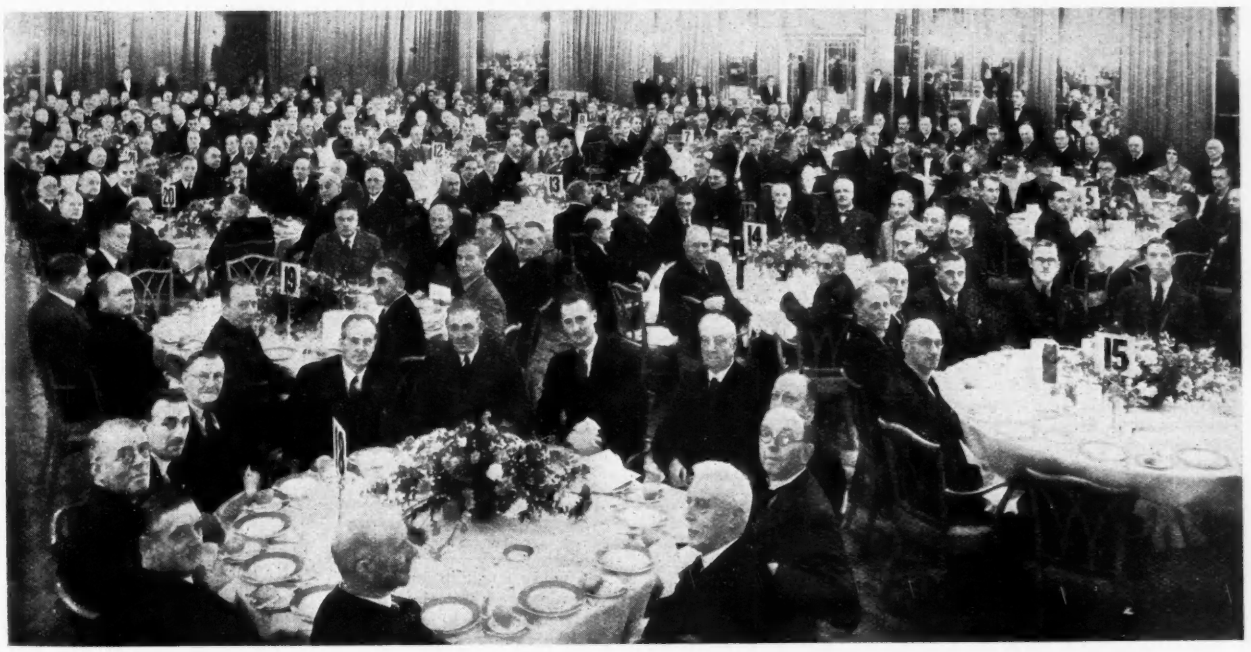
"There is much to be done," continued Sir David, "to ensure that housewives know all there is to be known about sound dietary principles; but we must not overlook the fact that instruction in the rules of good feeding is not the whole story. There are all sorts of practical and psychological obstacles in the way to prevent housewives from laying out the family food money just in the ideal manner an expert might advise. For one thing, kitchen conditions and household equipment can make it difficult for a woman to achieve perfect theoretical efficiency. And we, as a community of householders, are still very far from making full use of the opportunities good designers and mass manufacturers have put at our disposal in recent years. Our dietary education, if it is to succeed, must be based upon imagination and a sympathetic understanding of the real circumstances under which a woman works. It must show a woman that the choice and the efficient treatment of food does not necessarily mean being chained down to the kitchen. It must show her that there are better, sounder, wiser, ways of saving time than by spending money on expensive ready-prepared foods or using rough and ready cookery methods which may save a little time but will spoil a lot of the food. I believe that it is possible to approach this question sensibly, offering housewives with limited budgets advice that is neither above their heads nor beyond what can reasonably be expected of human nature. The Gas Industry will play its full part in such an attempt at practical betterment and is ready to co-operate in every possible way in the campaign, now being carried out under the auspices of the Board of Education, to teach a better understanding of food.

"But the problem is a very big one—too big for one industry and perhaps too big even for one department of State, however willing their efforts and however well-founded their methods. The whole question of National diet deserves an approach based on the principles of nationally-planned enquiry and education. I would like to see the formation of a National Food Authority, representing the national and local health and education authorities, some of the many great business interests concerned, individuals and institutions teaching domestic science, and last, but very far from least, housewives themselves. Such a body with an adequate income could undertake systematic investigation not merely into unsolved problems of dietetic science, but into practical domestic and human difficulties and the right way to overcome them. It could also be made responsible for a really effective campaign, enjoying the full co-operation of all the interests concerned, to bring home to the housewives the importance of the whole question of food and to show them how they can improve the health and well-being of their families while also safeguarding their own health and ensuring themselves increased leisure."

Sir David concluded by saying he knew he could pledge the Gas Industry to wholehearted support of such a project if those in authority saw fit to take the idea further.

Smoke Abatement.

Alderman JOHN E. DAW, J.P. (Chairman of the Devon County Council and a Past-President of the B.C.G.A.), proposed the toast of "The Guests." In the course of his remarks he said that, as



Delegates and Guests at the B.C.G.A. Luncheon at the Dorchester Hotel.

Leader of the London County Council, Mr. Herbert Morrison, whose name he coupled with the toast, was charged with the destinies of the greatest City in the world. His work was dedicated to increasing the security, the health, and the happiness of his fellow Londoners. Perhaps he (the speaker) might be allowed to draw his attention to one of the ways in which the Gas Industry also was seeking to improve conditions for the town dweller. This time they had entered upon a campaign to reduce the evils of smoke. It was common knowledge that the greater part of the smoke nuisance was due, not to the factories, but to the household chimneys. The object of the campaign was to stir the householder into action, to make him realize that the smokeless home was nowadays a practical possibility for every householder in the country. A great deal depended, however, on the example set by local authorities, who in these days were among the most important of their landlords, and he felt confident that they could rely upon Mr. Morrison's sympathy in their fight against the smoke menace.

The Rt. Hon. HERBERT MORRISON, M.P. (Leader of the London County Council), responding, referred to the smoke abatement question. They at the County Hall had, happily, always been the best of friends with the Gas Industry and the electricity industry. The Gas Industry were producers of smokeless fuel, and as such their first allies in the struggle against smoke, which was never far from their minds.

As one concerned with London's government, the ill-effects of smoke had been brought home to him. The two principal evils of smoke lay in its damaging effect on health and its depressing effect on the amenities of life. He thought they could imagine how heart-breaking it was to those who had planned new clean buildings—dwelling houses, hospitals, schools, and other buildings—and who had tried to bring sunlight to homes where before there was gloom, when they saw the first smears of smoke dirt on the walls, and knew that windows made for the sun would be shut against the poisonous smoke fog.

In London, the gloomy facts piled up against them. Every year, roughly, 240 tons of soot fell on every square mile of London. And not only could the industrial districts suffer: Westminster and Victoria, where the fuel industries' offices are congregated, showed very high records of atmospheric pollution. As a result, London's smoke fogs had acquired an international reputation. It had been calculated that smoke cost the people of London between £1 and 30s. per head per annum. Taking the population of the L.C.C. area as 4,000,000—and as a matter of fact it is more than that—that £1 per head, which was the best estimate yet made, was equivalent to a Council rate of 1s. 4d. or 1s. 5d. in the £. He thought it was clear that in some respects local authorities were in a key position to make possible and to apply a remedy for this admitted evil. They, more than anyone, were responsible for the conditions of modern urban life. Where did they stand at present?

Power to Restrict Industrial Smoke.

In the first place, they had certain powers. Under the Public Health Act, 1936, they had virtually unlimited power to restrict industrial smoke. It had not been found practicable to exercise these powers to the fullest extent; but persuasion and pressure had had a very considerable effect. It was, however, the refusal of Parliament to grant powers to control domestic smoke production which left the biggest gap in the coercive powers of local authorities. In London the volume of domestic to factory smoke was roughly in the proportion of 2:1; and they were powerless to deal with it save by persuasion. He did not now suggest that coercion was the only solution. But it was only fair to estimate the efforts of local authorities up to date in the light of this limited jurisdiction. In London, Metropolitan Borough Councils were the authorities concerned with smoke abatement, except for railway locomotives, which were in the Council's sphere. For the rest the County Council was only called in where the offending installation was owned by the Borough Council itself, as, for example, in the case of Borough power stations; where the Borough Council was declared in default; or where the Council was asked specially to co-operate.

The Council employed a number of coal officers who were responsible for the investigation of smoky trade processes. They had passed a by-law forbidding the emission of black smoke for periods exceeding 2 minutes in every half-hour. They were members of the D.S.I.R. Committee on atmospheric pollution, they had various powers to spend up to about £1,500 per annum on research, and they maintained a system of gauges to assist in the general work of measuring the extent and intensity of smoke pollution. In general, he thought they had been as active as anyone in the cause.

As regards the rest of the country, there had certainly been a general movement to intensify effort against smoke, leading to the formation of several regional advisory committees in the North, and various special proposals, such as the bold proposal for a smokeless zone in Manchester. They were very glad to greet the new regional advisory Smoke Abatement Committee for Greater London. And yet, despite the excellent work done by individual councils and the great interest aroused, both here and in the North, in what he might call local government circles, smoke abatement was doing little more than mark time.

Within the limits of its powers the L.C.C. was carefully examining the whole possibility of transforming London into a smokeless city, at least so far as concerned domestic fuel, which constituted the greater part of the problem. If the smokeless fuel industry through its various branches could satisfy them that practical alternatives to the combustion of raw coal existed, they would not be slow to act. He was aware that striking claims had been made already by the smokeless fuel industries. It was claimed that, quite apart from the national benefit of smoke abolition, smokeless fuel systems could show an actual monetary saving to the consumer while increasing his comfort and saving both health and unnecessary labour. Well, if he were a responsible member of the smokeless fuel industry, and he believed, on the basis of practical experiment, that such claims as those mentioned could be made good, he would not rest until he had found a means of proving them beyond possibility of doubt.

They in London could do a certain amount themselves but they needed continually the practical assistance of the smokeless fuel industry as a whole. They were ready to listen and learn, and would meet half-way an industry which could prove that smoke abolition in the ordinary household was fully practicable. He was sure that many other authorities would take the same view. And if some, local or national, were apathetic or deaf, then his advice was: Tackle them, and tackle them resolutely. Insist on a chance to prove their case, and in the end they would have to listen.

SMOKE ABATEMENT.

Mr. C. S. Shapley, of Leeds, has forwarded us a copy of the following remarks which he made at the afternoon session of the B.C.G.A. meeting when the topic of smoke abatement was under discussion.

On smoke abatement much has been said, written, and reported, but as yet we have merely touched on the fringe of the problem. The Press has been helpful in the publicity it has given it, but unless writers or speakers say something new it is not news, and therefore gets very little "space," so what about other means of combating this nuisance? Paid advertisements in the Press on the subject hardly receive even scant attention.

The Smoke Abatement Society is badly supported by the electricity industry and the Gas Industry, and therefore it comes down to this. Do the general public really and truly understand what smoke really does, and do they realize that England, taken as a whole, is the filthiest country in the world? Rid of the smoke curse, England, with its lovely country, vast resources, and improving cities and towns due to slum clearance schemes, would be the most wonderful country in the world.

The solution of the problem is largely in the hands of the population themselves. This is where you come up against the very first snag. As soon as you mention Smoke Abatement, Mr. Citizen says: "I agree with all you say, but I do like my one coal fire," and this is the greatest source of the trouble. I should say that household and office fires contribute 80% of this horrible scourge. Talking of office fires, one of the most wicked sights I have seen was one autumn morning when I was walking down past the Horse Guards Parade in Whitehall, by the side of the park. What did I see? Every chimney in all the Government Offices, from end to end, all belching forth smoke. I hope this reaches the Minister of Health and that he will take that walk and see that it's put right.

I have really referred to the better class of house, but as soon as one considers the vast numbers of middle class and artisan population, the question is one of finance—in other words, electricity and gas for continuous heating are too dear, and with this I agree. Here is the crux of the whole position.

Wireless sets not long ago were beyond the pockets of this class, but to-day they are to be found in the most humble homes. This has been made possible by the universal use of wireless; therefore I can assure you and the public that if the smoke nuisance were abolished, either voluntarily or by Act of Parliament, gas would be available so cheaply that the cost would not need to be considered. But before this could be achieved, we should hear the pampered coal industry wailing, as it did when it was proposed to establish a "smokeless area" in Manchester. On that occasion, their deputation declared that "if the proposed regulations were enforced, they would involve the coal industry in a great loss and probably result in an increase of the price of coal to individual consumers of 3s. a ton."

Of course it is not so, as everyone in the electricity and gas industries knows that *more* coal would be required than at present, and therefore they and the railway companies would not be affected. Coming back to the question of cost—have the general

public counted the cost? They have much to offset the cost of electricity and gas:

The lost hours of washday, involving the washing of dusters, blouses, woollies, curtains, collars, handkerchiefs, and all household linen, all of which would not require half the washing in a smokeless atmosphere.

The food that is spoilt due to smuts.

The chimney sweep would be out of work.

Houses and property would not need half the painting.

The work and drudgery connected with the cleaning up of the hearth, laying the fire, attending to it all day, and the extra dusting of the rooms would all be done away with.

To this, add the cost of cleaning materials, the extra cleaning of windows occasioned, the cost of blacklead, ashpans, and fender brushes.

The ruination of stone buildings, the cost of corrosion on steel.

The Office of Works spends £120,000 per annum on cleaning and renewals in public buildings, while it is computed that £2,000,000 is spent annually entirely due to smoke.

All this has to be paid for, and John Citizen has to foot this heavy charge, whereas if he used electricity, gas, or solid smokeless fuel, he would eliminate all this burden. It would only mean a little sacrifice for two or three years.

Added to all I have said, it would not be necessary for doctors to spend all their time attending patients suffering from illnesses caused by the smoke menace. They would have time available and their energies could be used in building up a fitter nation.

What are we going to do about it? I suggest first that Chairmen and Managers go back and persuade their Boards or Committees to take some action, and to support the Smoke Abatement Society financially. Secondly, that the Government should commence by legislation to abolish the use of coal in all offices, and in houses above a certain rateable value.

Lancashire District Tar Board

Contracts with Highways Authorities

Representatives of Highways Authorities in Lancashire and Chesnire were invited by the Lancashire District Tar Board of the British Road Tar Association to view the Association's film "Tar Carpets," in the Demonstration Hall, Gas Department Showrooms, Town Hall Extension, Manchester, on Oct. 20.

Mr. T. REYNOLDS (Stockport), Chairman of the Board, presided over the proceedings.

The film, in the first place, shows illustrations of the wearing of road surfaces under modern traffic conditions, and a considerable portion of its first half is devoted to the technical research work of the B.R.T.A., particularly in regard to the provision of a special type of binder. Laboratory methods of dealing with distillation and viscosity problems are depicted. Experiments are shown in regard to accelerated weathering and the adhesion of the tar to stone in the presence of water.

The preparation of trial carpet mixtures on a laboratory scale, pressure and compacting tests, and resistance to deformation under load are shown. Special care is taken to control the temperature and proportions of ingredients so that it may be possible for a tar carpet to be laid at all times of the year.

The representatives were subsequently entertained at luncheon at the Midland Hotel.

Improvements in Road Tars.

Mr. W. J. HADFIELD (formerly City Surveyor and Engineer to the Sheffield Corporation, and now a Consultant to the B.R.T.A.) said that 30 years ago dehydrated tar was used with very good results, and there was to-day a road made of dehydrated tar in the Sheffield area which had been in use since 1912-13. He referred to the Manchester Road, which carried several thousand tons of traffic per day. The tarmacadam was still in very good condition. It might be enquired why, if that was the case, efforts should constantly be made to effect improvements in tar. But the conditions in 1912-13 were different from those of the present time. Then it was mostly a case of horse-drawn traffic with very few motors; to-day it was a case of nearly all motors and very few horses indeed. Therefore nowadays a different binder was necessary in order to obtain a long life from a tarmacadam road.

A different kind of aggregate was also used. In the old days he had used slag if possible, and limestone otherwise. Everyone present would know that those were aggregates to which tar took very kindly, but to-day a rather harder aggregate was used which again needed a different quality of tar.

No binder had a better adherence to stone under wet conditions than tar. Vertical tars properly distilled were very suitable for surface dressing. There were also horizontal tars and coke-oven tars, and when one of them did not do exactly what was required of it it was used to make a blend which would produce a suitable tar. Tar, as they knew, was most carefully distilled to-day, and an illustration of a continuous distillation plant was given in the film viewed earlier in the day. This type of plant, and other modern plants, distilled the tar in fractions. The distillations took out the oil, and they took out of the tar exactly what the surveyor did not desire to have, leaving the tar without any poisonous ingredients in it at all, so that it was quite innocuous to fish. When these processes were completed oils were added to it which were necessary for the tar to give good service.

Road Tar Specifications.

It was a most extraordinary thing that in spite of the hundreds of standard specifications obtaining in this country, until the present year there had never been a specification for tarmacadam. He spoke not merely as a consultant to the Association, but also as an engineer. In his opinion the use of tarmacadam had been neglected in the past because many people had not made it to a very carefully prepared specification. To-day, there was a specification published which every surveyor was entitled to use; and no doubt in due course the Ministry would require that standard to be adopted. It would certainly help surveyors to obtain a better tarmacadam—*i.e.*, one which was better mixed, and which was more likely to stand up to present-day traffic conditions.

A great deal of work had been undertaken in laboratories, but such work was of no avail unless it would stand up to the practical tests of everyday usage. A new specification had been adopted for the preparation of tarmacadam, and a new specification for tar was wanted. Tar was in the peculiar position that, while the proprietors of many commodities had a difficulty in bringing them up to specification, nearly all the tar which was sold was above standard specification. This was one reason why research work was being undertaken by the Government. Chemists engaged upon the work now wanted to test the results they had obtained on the roads. With the assistance of the Ministry of Transport last year ten lengths of tar dressing were laid on the Great North Road, a few miles outside London. This year a further number of lengths of dressing had been laid. Speaking particularly of the lengths laid last year, ten different tars were used which were thought likely to be of differing durabilities. They had now done 16 months' service on a length of road taking eight thousand tons of traffic a day, and not one length could yet be picked out as being less durable than another. This was surely a good indication of the excellent quality of the tars, and also of the difficulties confronting the chemists in the preparation of a new specification.

Furthermore, with the assistance of the Ministry of Transport the B.R.T.A. put down some lengths of tarmacadam on the Kingston By-pass road. That tarmacadam had been down for seven or eight years, and was carrying seven to eight thousand tons of traffic a day. Calculation would show that 43 million tons of traffic had passed over it. He saw it a fortnight ago and it was perfectly good. In view of this, he could not imagine that anyone could argue there had not been an improvement in the method of tar production.

His idea about tar carpets was that they were not going to take the place of tar dressing which would not only last, but its cost over a number of years would work out at a lower rate per yard. He thought both had their definite sphere of usefulness. He was pleased to be able to report that some lengths on concrete roads were now being tarred and standing very well up to heavy traffic conditions.

Col. W. M. CARR proposed the health of the Chairman, Mr. T. Reynolds, saying that the B.R.T.A. should concentrate its efforts upon preventing the sale of dehydrated tar as such—namely, tar which was not prepared to a definite specification. Although he did not profess to know very much about roads, he was aware that tar could be produced which was equal in every way to bitumen. He appealed for an effort to be made to extend the scope of the work of the Association throughout all the districts of the country. He would like to see a liaison between the B.R.T.A. and the Institution of Municipal and County Engineers, with a view to collaborating in experimental work for their mutual benefit. He was of opinion that some of the money which the B.R.T.A. were spending in other ways would be better applied in practical experiments. Mr. Hadfield had referred to experiments carried out in conjunction with the Ministry of Transport, and he hoped the scope for such experiments would be extended to district areas.

Mr. REYNOLDS, responding, said it was incumbent upon the crude tar producers to co-operate with the distillers for the purpose of providing road surveyors with the tar material required. It was the road surveyors whom it was necessary to convince of the value of the product they had to offer, and every effort would be made to meet their requirements.

EXPERIENCES OF

by H. P. LUPTON,
of the Liverpool Gas Company.

A Gas Development Centre

A Paper read before the Manchester Association of Gas Engineers at their General Meeting held in Manchester on Friday, Oct. 14. Concluded from p. 206 of last week's "JOURNAL."

In cases where a closer estimate is asked for, the calculation is made according to the following formula:

$$\frac{\text{Net heat requirements in B.Th.U. per hour}}{100{,}000} \times \text{hours/day} \times \text{days/week} \times \frac{6}{10} \times \frac{100}{80} \times 30$$

giving the therms required for a 30-week season.

It is interesting to note that in only two cases out of well over a hundred estimates has the Company's forecast been on the low side. Fig. 4 shows a typical installation. This

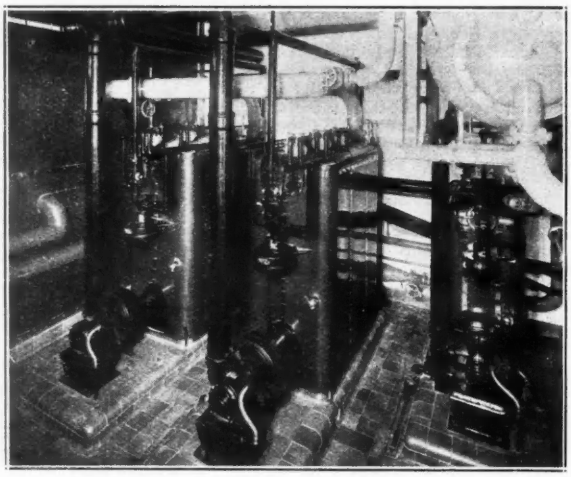


Fig. 4.

member has secured a good many orders for steam raising plant for dairymen, laundries and for canteens. The most interesting plant is that installed at the Corporation Food Centre, where meals for 12,000 children are cooked daily. The cost of gas, for direct heating and for steam raising, is 0·1d. per child per day. This amount includes for gas used for the supply of hot water for kitchen purposes and for cleaning.

A full description of this installation is to be given in a Paper by Mr. Bell, a member of the industrial staff of the Liverpool Gas Company, which is to be read before the Manchester Junior Gas Association.

Another good installation is that of four steam boilers having an hourly output of 12 million B.Th.U. The steam from this plant is being used for air heaters in various parts of the factory, for heating water and for cooking in the works canteen. Fig. 5 shows one of the steam installations.

(11) Our Co-operative Society is considering increasing its plant so as to provide meals for 600 children. Some of the menus can be managed with existing plant, but for the menus which are shown on the enclosed leaflets additional plant will be required. Please advise me what plant to recommend.

After an examination of the menus it was suggested that two 45 gallon stainless steel boilers would be suitable for cooking Irish stew and stewed mutton, with a 25 gallon stainless steel boiler for custard. A pressure gas-heated steamer was recommended for potatoes. It was also suggested that, for steamed puddings, long metal cylindrical tins, which were hinged along the side, would fit better into the steamer and would hold a larger quantity of pudding than would basins. Pudding in the form of long rolls would be easier to cut up and serve than would pudding contained in basins.

It was suggested that cabbage could be done in the large boilers if suitable wire baskets were provided. The management of the Co-operative Society, after receiving these suggestions, asked if a visit could be arranged to some kitchens where the appliances suggested were in use. Such arrangements were made. The member undertaking was then given an order for the equipment and the Centre was asked to be responsible for the wire baskets and special pudding containers.

(12) A local confectioner feels tied down with his present coke-fired oven and would like to visit shops where a gas-fired oven is in use. Can you make arrangements for our client to inspect several ovens?

Arrangements were made and the client was taken to see several ovens. A few weeks later he placed an order for a confectioner's oven with the member undertaking.

(13) A fire-lighter maker is dissatisfied with his plant for melting naphthalene. In what way could gas be used as the heating medium?

It appeared that the fire-lighter manufacturer had used a water jacketed tank of 3 cwt. capacity and that three 5 kilowatt immersion heaters had been fitted in the bottom of the water compartment. This method had been far too costly. Two immersion heaters had then been removed and replaced

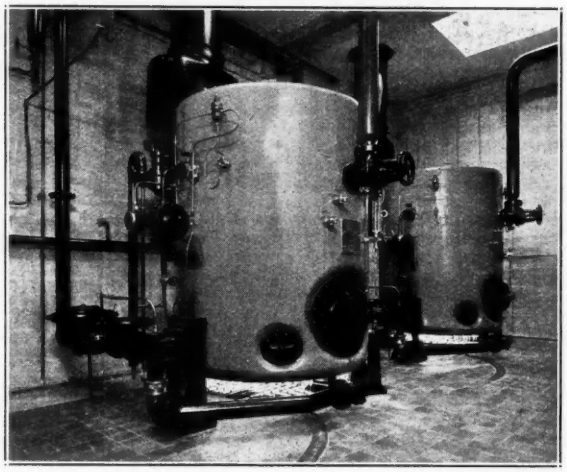


Fig. 5.

Two Cochran "Sinuflo" steam boilers. Total evaporation, 3,330 lb. per hr. from and at 212°F. Showing steam pressure control device and automatic low-level cut out.

by circulating pipes from a coke boiler. This method failed to give satisfaction.

It was recommended that the member should heat the naphthalene tank directly by means of burners placed well below the bottom of the tank. The tank would be encased

so that products would circulate round the sides of the tank and a direct acting thermostat would be placed in the tank. Several conversions of existing tanks had been made by the Centre for local fire-lighter manufacturers. The member undertaking secured the order and fitted a burner with a gas consumption of 175 cu.ft. per hour.

(14) I shall be obliged if a member of the Centre Staff familiar with the requirements of bakers and confectioners can be spared for several days to make a survey of our local firms.

A member of the staff was sent to the member undertaking and visited the confectioners in the area. The visit resulted in one order on the spot and in five enquiries to be followed up by the gas undertaking. Other firms expressed interest and agreed to get into touch with the gas department if new equipment was required. It was definitely felt that the survey had aroused interest among the confectioners concerning gas-fired ovens and other gas equipment.

(15) What gas-fired plant is available for a local ice-cream manufacturer?

Details were submitted of steam boilers, of self-contained steam jacketed pans, of non-jacketed direct heated pans (which are in use but are not recommended), of sterilizing chests, and of refrigerators. Special stress was put on the steam jacketed boiler. Several of these boilers had been installed by the Liverpool Gas Company and all had worked well. A full description of this boiler, together with test figures has been given in one of the Liverpool Gas Development Centre Reports. An experience with a local ice-cream maker may be of interest. This consumer had a 60-gallon steam jacketed boiler. He reported one day that the whole of his cream had turned sour. As the weather had been very hot, the milk supply was blamed, but next day he boiled half his milk supply in his own boiler and half in a different type of boiler on a friend's premises. His cream again turned sour whereas the cream done elsewhere remained perfectly good. He straightway blamed the boiler. As several more batches were lost, the boiler was collected and carefully scalded and dried and retinned. When put into use, the cream again soured. It was suggested that the pails were at fault and at length a few new pails were purchased. Cream in the new pails remained sweet whereas that stored in the old pails again turned. A complete set of new pails cured the complaint.

(16) Kindly send details of a gas heated dish-washing machine. Can arrangements be made for our client to inspect such a machine while it is actually in operation?

Details were submitted of a dish-washing machine of both the two and three tank sizes. In a two tank machine, handling a thousand pieces per hour, one tank is fitted with a $\frac{1}{8}$ h.p. motor and screw, and each tank has independent gas burners and thermostatic control. On a two tank machine the gas consumption has been approximately 120 cu.ft. per hour and the current consumption approximately 100 watts. The water in the dirty crockery compartment is kept at a temperature of 130° F. while the water in the clean compartment is kept at 190° F. Specially shaped wire baskets hold the dishes so that the risk of damage is reduced to a minimum. Arrangements were made for the client to inspect a two compartment washer in actual use (fig. 6).

(17) A consumer has made two enquiries and to deal with these the assistance of the Centre will be appreciated. In the first place he would like a scheme to be submitted for a drying room for sides of bacon. Details of space available are shown on the enclosed print. In the second place he has a tank which is used as a container for two hogsheads of molasses. For the convenience of filling small jars there is attached to the sides of the tank a quick shut-off valve, but our consumer finds that in cold weather the syrup thickens to such an extent that it is almost impossible to run it off. He is anxious to find a means of keeping the contents of the tank at such a temperature as will make it reasonably fluid.

Each of these enquiries was satisfactorily dealt with. For the bacon drying room, which was 12 ft. by 7 ft. by 10 ft. high, a blue print was submitted showing the suggested layout of an air heating plant. The air heater was similar to a number already designed by the Centre and was capable of a gas consumption of 100 cu.ft. per hour, although it was estimated that the average consumption would be in the region of 50 cu.ft. The fan set was capable of a delivery of 12,000 cu.ft. of air per hour. The air ducting was led to a level just below the ceiling at one end of the room and warm air entered the room through three ports. At the opposite end two outlets were arranged near the floor level and were capable of control by suitable dampers. The installation was equipped with room thermostat and with a G.L.C. air safety valve. The scheme was approved by the client and the order was given. It is understood that the installation has met all the requirements made upon it.

For the second part of the enquiry, it was necessary to visit the client, as it was found that the tank was supported in an unusual way. During the visit it was discovered that electrical immersion heaters had been tried but that these had solidified the syrup immediately surrounding them. At the time of the visit the consumer was using two gas burners underneath the tank but these were not satisfactory as the heat was too local. The method suggested to overcome the

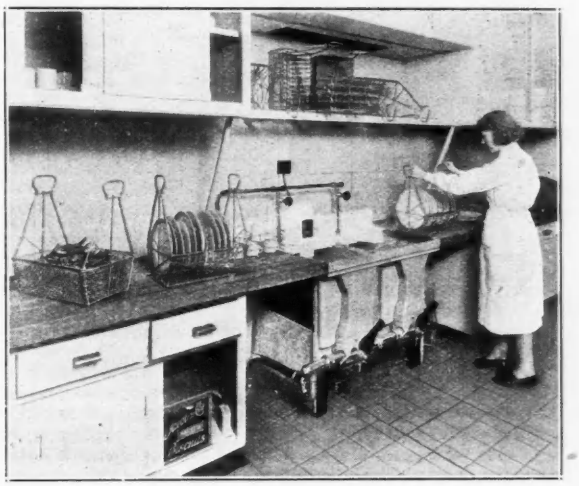


Fig. 6.

trouble was to fit round one end and under the bottom of the tank an "L" shaped water jacket. This was connected by flow and return pipes to a thermostatically-controlled Daisy heater.

(18) We have an enquiry for a hot air plant for the drying of sweet bottles. Can you give us the names of firms which supply complete installations for giving an output of 300 dried bottles per hour?

Names were submitted and the member obtained an order for a 50 nozzle plant. In this plant hot air is delivered from a gas-fired air heater to a hot air chamber which carries 50 nozzles fitted with circular carrying frames for the bottles. When a bottle is placed on its frame a valve is opened and allows hot air to pass through the nozzle to the interior of the bottle. The removal of the bottle allows the air valve to close. There is thus no loss of hot air through nozzles that are not doing useful work. The air system is arranged so that excess air can recirculate through the heater and so that a certain volume of fresh air can be added to the system. The gas consumption averages 175 cu.ft. when drying bottles at the rate of 250 to 300 per hour. The air is heated to a temperature of 170° F. (fig. 7).

(19) Details are required of sterilizers suitable for cow-keepers and dairymen.

Particulars were sent of the appliances made by the Liverpool Gas Company and by various dairy equipment firms. This resulted in the member asking if a prospective consumer could inspect sterilizers in the Centre Showroom. After the

inspection it was found that the size of sterilizer required was such that it could not be passed through any opening in the sterilizing room of the client. The Centre was asked to quote for a special size chest to be built in halves. This was done

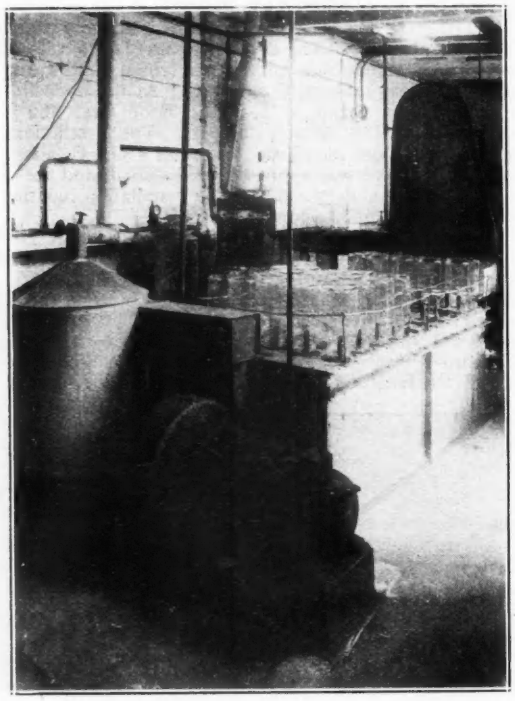


Fig. 7.

and an order was obtained by the member. Several sterilizers have been supplied as a result of this order.

(20) An exhibition is shortly to be held and it is hoped to include a selection of large scale catering equipment. As we do not carry a stock of such equipment, I shall be obliged if the Centre can supply a suitable selection.

A selection was made including a wall type range, a hot closet, a Rotapan, a small confectioner's oven, a pie warmer, a pea and bean warmer, and a milk boiler. A working model of a Perfecta thermostat and relay valve was also supplied. The loan of the equipment was so appreciated that similar arrangements have been made on several other occasions.

(21) This member has made very considerable use of the Centre and obtained some very good orders. The following are a few of the enquiries made:

(*a*) Details are required of gas equipment suitable for a hide drying room.

(*b*) Can you give particulars of a gas-heated cream emulsifier?

(*c*) Please state a case for the use of gas-fired central heating boilers for school heating. The local authorities are not favourably disposed.

(*d*) Details are required of a furnace for melting small quantities of cast iron.

(*e*) Kindly arrange for a visit to discuss the possibility of converting a calcining plant from coke to gas firing.

(*f*) Your comments will be appreciated upon the usefulness or otherwise of the Robot governor.

(*g*) Please send details of a gas-heated water tempering and measuring tank for a bakery.

(*h*) Please supply details of a gas-heated wire tinning bath.

(*i*) With regard to the gas carburettor suitable for attachment to petrol engines and which I saw at the Centre during a recent visit, I shall be obliged if you will loan the appliance to me as I have a firm in my area who is interested.

(*j*) A provision merchant who prepares a large quantity of cooked hams uses a coke-fired steam boiler. If running costs on gas will not exceed £60 per quarter, he will consider a gas-fired steam boiler. We shall appreciate the Centre's advice as we have no experience of this type of problem.

(*k*) Confectioners who visited the Centre at the time of the Exhibition for Bakers, Confectioners, and Butchers propose to build a new bakery. Can you arrange for a member of the Centre staff to meet the directors at my office to discuss the possibility of an all-gas bakery?

(*l*) A firm propose to install furnaces for case-hardening and billet heating. At the moment oil furnaces are favoured. Can we put forward a case for gas?

In enquiry (*j*) the Centre was able to carry the day for gas. As the firm asked the member to do all the installation work the Centre had to prepare all drawings, giving the layout, size of gas and steam pipes, details of steam traps and condensed water fittings, and, in fact, all details to ensure the satisfactory working of steam boiler and steam-jacketed pans. The completed installation is shown in fig. 8. In enquiry (*k*), by taking the management to various premises they became very impressed by the advantages gas could offer, and they finally gave our member an order for a Cochran gas-fired steam boiler and for hot air gas fired ovens. In enquiry (*l*), an interesting confusion arose. During the interview a member of the firm stated that the price of gas was far too high at 4d. per therm. He claimed that if gas could be supplied at the price of 2·1d. per therm, as it was where the firm had a branch works, he would give the order for gas furnaces at once. Being challenged to state where he was obtaining gas at 2·1d. per therm, he produced a recent gas account from which it appeared that gas was being charged at 2s. 1d. per 1,000 cu.ft. Realizing that our member was offering gas at a lower price than 2s. 1d. per 1,000 cu.ft., he agreed to pass an order for a gas supply for the new furnaces.

(22) The following enquiry caused the Centre some anxiety: We have received an enquiry from a customer who annually sterilizes a considerable quantity of bulbs. At the present time they are being done by immersion in water which is heated to 112° F. by the medium of gas burners. The question has been raised as to whether it would be possible to construct an appliance with an automatic feed to operate throughout the 24 hours. At the present time, it is necessary for a man to be in attendance the whole of the time, and if the above suggestion could be satisfactorily carried out, a considerable saving would be effected thereby. The bulbs are actually immersed for three hours, and the temperature required should not vary outside the limits of 110° and 112° F. Any information that you have available will be greatly appreciated.

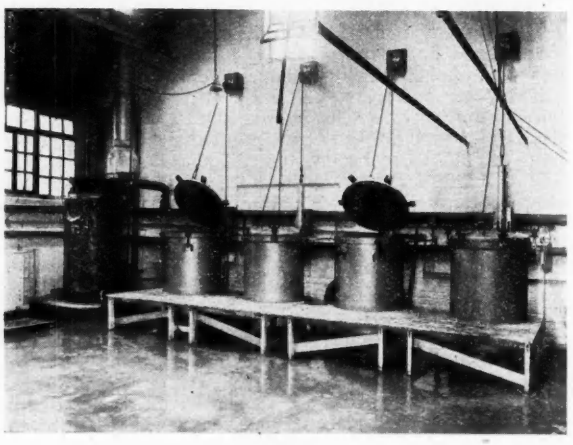


Fig. 8.

Looking into this enquiry, it was found that daffodils, nar-

cissi, and other bulbs suffer from an eelworm disease. Immersion of affected bulbs in hot water at a temperature of 110° F. destroys the eelworm and its eggs. It was found that there was a set of standard hot water baths with capsule control already on the market and that a temperature control of plus or minus half a degree Fahrenheit was claimed. These baths, however, were only capable of treating one batch of bulbs at a time and, therefore, had to be attended at three-hour intervals, when the trays had to be emptied of treated bulbs and a new batch loaded. As this Centre was not familiar with any automatic plant, an appeal was made to other Centres. Within a very short time replies came to hand and the one finally suggested to the member undertaking was as follows:

The design consists of a 3 ft. diameter wheel with seven rectangular bulb carrying baskets each measuring 1 ft. square by 3 ft. long, having a capacity of approximately 600 2 in. diameter bulbs. Assuming it takes three hours for each basket to pass through the water bath, which is equivalent to a third of the circumference of the wheel, it will take approximately nine hours to complete a revolution of the wheel, which is approximately 13,000 bulbs per day.

Any local engineering firm would be prepared to construct this plant and the water heating equipment could be done by the gas undertaking.

(23) A member of our staff who attended the meeting yesterday states that you mentioned that multipoint heaters fitted with sprays were being used at garages for the purpose of washing cars with hot water. A local garage proprietor is interested in this proposal and would like to visit a garage where it is in use. Would it be possible to arrange this?

Arrangements were made for a visit. The proprietor explained that the multipoint heater was only sufficient for one spray. The nozzle is used alternatively as a spray and a jet, and when the spray is being used it is held close to the bodywork and used with a scrubbing action. It is claimed that sponging, &c., is unnecessary and that the car dries quickly without any dust film deposit and is ready for polishing.

The hot water softens and then washes away the dirt and is not detrimental to the enamel as high pressure cold water, which knocks off the dirt, may be.

The figures given at this particular garage were:

Temperature of inlet water	50° F.
Average temperature of outlet water	135° F.
Hot water supply	1½ galls./min.
Time to wash average car	30 mins.
Average amount of hot water per car	20 galls.
Average gas consumption per car	100 cu.ft.

The proprietor expressed himself as being highly satisfied with the installation.

The examples given above of the type of problems handed over to the Centre must, it is felt, convince any gas engineer that Centres are a vital necessity. It is certain that in many cases, but for the Centre, an enquiry would not have been accepted or dealt with by quite a few gas undertakings.

Furthermore, as has been stated on numerous occasions, the industrial business will not come to us. I well remember the astonishment of one member when informed that an ice-cream dealer had called at the Centre. The dealer had his premises right opposite the entrance to the member's works, but had never approached the gas department regarding his requirements. The meetings of staff members and the issue of reports indicates to members the type of general business which is waiting for attention, and the type of plant suitable for such business. There is a large field awaiting the investigation of the staff of the Gas Industry, and I feel convinced that those undertakings which are members of a Centre will make ever more and more use of its services provided they themselves look out for new loads. The pity is that quite a number of undertakings feel that they can look after their own enquiries and solve them in a satisfactory manner. I say without hesitation that if the undertaking is determined to increase its load on the commercial and industrial side cases will arise where, without assistance, a possible load will be lost. The loss of such a load may easily cause the loss elsewhere of a similar kind of load, as the possible consumer may hear that gas was unable to perform the work in the first case, and so he does not consider gas for his own case. From experience before the Liverpool Gas Development Centre came into being, I am positive that the average salesman will find it impossible to discuss with consumers in his area some of the problems that will be raised. Only by special training and a wide experience will the requisite knowledge be available.

Finally, I hope that this Paper will have interested my hearers and that those who have not joined a Centre will be led to consider the advisability of speedily becoming members, not only for the good of their own undertaking, but for the benefit of the Industry as a whole. The strength of a chain is that of its weakest link.

This Paper so far has dealt with the help a Centre can give to its members. It must be remembered, however, that the first contact with a consumer must be made by the member undertaking, and it will be those members with the greatest keenness for new loads who will derive most benefit from the Centre Scheme.

The Centre has time and again indicated to members the price at which gas can be quoted with a reasonable chance of obtaining the load, and no effort of the Centre will be successful if the member does not introduce a satisfactory scale of charges. Bakery engineering firms and heating engineers have often complained of the difficulty they experience in getting a reasonable price quoted for large loads when they have been dealing with some of the smaller undertakings. One member has submitted plans of a factory, a printing works, a new golf club, and of other premises asking for the Centre's suggestions for a central heating cost. On each occasion the price quoted for gas has been 7d. per therm. What earthly chance has gas at this price of securing the load for the above type of premises?

I close by quoting from the National Report:

"The Industrial Gas Centres Committee, consisting of representatives of each Centre and of the National bodies, meets once a month. These regular meetings are of the greatest value in maintaining personal contact between those in the Industry engaged in work on industrial gas. They are enabled to discuss all the current technical problems both formally and informally, and they are also able to discuss and agree on general policy concerning the running of the Centres, their relations with manufacturers, Government Departments, &c. The effect of this unification on the industrial side of the Industry has been noticed with considerable respect by outside firms which deal with different gas undertakings throughout the country, and the organization has enhanced the Industry's prestige considerably. Other advantages of these regular meetings are that news of new appliances or processes spreads quickly throughout the Industry and test results and opinions can be rapidly compared, while duplication of development work is easily prevented. Faults in existing appliances can readily be traced and evidence from all over the country quickly collected and put before the maker concerned.

"It can be readily seen that through the Centres organization the experience of the whole Industry can be put at the disposal of any member undertaking in a very short time."

With other fuel and energy suppliers straining every nerve to capture the industrial load, the Gas Industry cannot afford to remain idle. For the payment of a small subscription every gas undertaking in the country can have the assistance of the Centres Organization. Whenever a potential gas load is held or obtained by a competing fuel, the information is passed on and is used by our competitors to sell their own fuel. It is therefore imperative that every undertaking should ensure that its staff has the fullest and best advice for every enquiry received or for every visit made. Such advice can be obtained through the Centre Organization. The position can be summed up in the phrase "All for each and each for all."

Discussion.

Mr. F. G. SHAW (Buxton) said he had been asked by Mr. T. Reynolds to bring before the Manchester District members present the desirability of following Liverpool's example by establishing an Industrial Centre in their own very great industrial district. Why Manchester had not an Industrial Centre while Liverpool had one was one of the most remarkable things he had come across in his experience. There must be some reason for it. The extraordinarily effective way in which Mr. Lupton had secured results by the Liverpool organization should inspire Manchester members to start a similar centre. It was true that a large amount of industrial business was done, and no doubt the

organization in individual undertakings was very good indeed. Nevertheless, they must, he thought, believe that specialist knowledge was needed. He thought Mr. Reynolds wished to emphasize that particular point.

With regard to the Paper itself, there were one or two difficulties he had met with in connexion with which he might perhaps draw upon Mr. Lupton's knowledge. In his town they had a gas-fired boiler with an output of about 1,500 lb. per hour. The trouble was the noise from the boiler, which, although it appeared to be working properly, was causing great annoyance in the neighbourhood. Special burners had been fitted, and many means had been tried to blanket off the noise. As the boiler was fixed in a sort of vaulted chamber, with communicating chambers round it, the noise was being transmitted to residential property in the neighbourhood. As a matter of fact, it was in rather bad odour with one or two people because of this.

Mr. Lupton had spoken of the contamination of milk from the pails used. Gas was being blamed for the contamination. He had the remarkable case of a wash boiler that was used as a steamer for vegetables and for the preparation of chicken for invalids, and so forth, on a fairly large scale. The food in the boiler was constantly becoming discoloured, and a very great amount of research work was carried out by the makers and himself; but they were unable to find the cause of the discoloration. A new boiler was fixed by the makers, and again the discoloration continued. He then ordered an entirely new boiler from another firm. It was fixed, and since then there had not been the slightest trouble. Although the metal of the boiler had been examined it was not possible to discover the cause. In such matters action must be taken rather quickly unless one was going to lose a valuable customer. Had Mr. Lupton any similar experience of the discoloration of food in boilers of that type?

Mr. R. J. RESTALL (Stalybridge) thought Mr. Lupton's Paper was definitely a Gas Centre Paper. It showed what could be done by co-operation. A great deal of time and very hard work was necessary in order to achieve the results which the Liverpool Centre now obtained. His own Undertaking did not wish to receive anything gratis but were prepared to pay for any information which they received. In 1934 his Committee agreed to become members of a Manchester Centre. A Memorandum was prepared by Manchester, and it would be noted that Liverpool accepted the Memorandum with a few modifications, and proceeded with the work. Manchester had done nothing of a concrete nature. He appealed to all the members of the Manchester district, who were interested in industrial gas, to show a little more determination in starting the Scheme. Manchester was very good in regard to supplying information either from their own files or which had been collected from Centres up and down the country; but it was not like obtaining a service and paying one's own share of the expenses towards it.

Merging of Contributions.

Mr. F. N. BOOTH (Keighley) said he thought he was correct in stating that a works making 400 million cu.ft. per annum would contribute £10 per annum towards an Industrial Centre. He did not understand why the contribution which the Undertaking made to the National Gas Council at the rate of 10s. per million cu.ft. per annum could not cover the services of an Industrial Centre. A works making 400 million cu.ft. per annum contributed £200 to the N.G.C. It was only reasonable to suppose that if a Gas Undertaking did take advantage of an Industrial Development Centre its gas consumption would increase; and if it should increase at the rate of 5% it would be £10. The contribution to the National Gas Council would be £210 per annum, which would be the original £200 *plus* the £10 to the Gas Development Centre. Could not the contribution be merged into the contribution paid to the National Gas Council and so make a national affair of the matter instead of localizing it?

Mr. DAVID C. GUNN (Secretary, Yorkshire Industrial Gas Development Centre) said it was evident that Mr. Lupton had organized a highly efficient Industrial Gas Development Centre, which had been of great service to the subscribing undertakings. The Yorkshire Centre was organized on similar lines, although it was independent of any one gas undertaking. When questions of showroom demonstration or investigation work had to be dealt with then the Industrial Departments of the largest subscribing undertakings, such as Leeds and Sheffield, were consulted. The Yorkshire Centre had 59 subscribing undertakings, representing 92% of the total output of gas in the area. Enquiries received often necessitated the Technical Staff of the Centre visiting a subscribing undertaking and with them approaching the manufacturer concerned. Among enquiries so dealt with in the past few weeks might be mentioned:

(1) The fusion of enamels on to glass. The firm in question at the moment operated old kilns which were extremely extravagant in gas consumption, and owing to their out-of-date design could not be altered in order to economize. Two proposals were put forward, in each case giving a gas consumption of about one-sixth of that being used at present, together with advantages accruing from improvement in output.

(2) Another subscribing undertaking received an enquiry from a local manufacturer asking for a conversion of an existing steam boiler used for heating the factory. It was pointed out that a conversion, while being possible and possessing the benefits of fully automatic control, would be undesirable from a point of view of running costs, and that at the moment the scheme for heating the factory was entirely inadequate.

Two alternative proposals were put forward by the Centre, one for the supply of a new boiler designed for gas firing, the other for direct heating of the shops with radiant panels.

(3) A large firm of electrical machinery manufacturers approached their local gas undertaking with a view to the conversion of oil-fired armature drying stoves to gas firing. A visit showed that this could be arranged very easily, but the manufacturers in question either could not or would not reveal the running costs on existing oil-firing. It was therefore necessary for the Centre to obtain complete particulars of dimensions and construction of the ovens and from this deduce the probable running costs.

The Yorkshire Centre furthermore co-operated in the National Report, sending in its contributions from time to time. As occasion demanded, it also published reports of its own. Meetings of the Technical Staff of subscribing undertakings were held monthly at the headquarters of the Centre, at which about 20 undertakings were represented. Lively discussions took place and the Minutes were forwarded to all subscribing undertakings before the next Meeting. There was, however, one question he would like to ask Mr. Lupton. Enquiry No. 13 dealt with the use of gas for melting naphthalene in the manufacture of fire-lighters. From what material was the tank manufactured, and was it the experience of the Liverpool Centre that direct firing of the tank was completely safe and satisfactory?

Mr. JAMES CARR (Stretford) referred to the making of industrial surveys in Trafford Park by the Stretford Gas Company. He heartily agreed that a Centre should be established in Manchester. He had found that some industrial problems took as long as 15 months to solve, and one had actually taken as long as ten years, in fighting oil fuel. An increase in the cost of coal would create a very serious position for the Industry. In Stretford they were particularly fortunate in securing the services of an Engineer who had had experience of all kinds of industrial furnaces—electrical, oil, solid fuel, and gas-fired—and who was thus able to explain the outstanding advantages of gas to an industrial consumer.

Gas *v.* Coke.

Mr. H. SINGLETON (Huddersfield) said that taking coke at 30s. and gas at 4d. per therm, the gas on a fuel basis was about 75% dearer than the coke, but business could be obtained for gas. He mentioned two interesting cases. One was where a coke boiler was converted to gas, and the cost for the gas came out at 25% more than the coke. The people were quite delighted with the installation. It was only a small installation of two million cu.ft. per year. The gas was 4¼d. per therm. In the case of a very large installation the cost was 3d. per therm, and the weekly gas cost for heating was £43 2s. They then put in coke with modern boilers and the weekly coke cost was £17 4s. It was rather disappointing to have a case like this, because it did no good from the standpoint of pushing gas for industrial business.

The PRESIDENT referred to non-members applying to the Centre for information—being evidently under the impression that it ought to be supplied to them.

Mr. C. BATEMAN (Harrogate) asked if the industrial appliance department was entirely divorced from the domestic. How was a customer dealt with who called at the main showrooms, say, with reference to some appliance which was handled at the Industrial Centre? The great diversity of questions handled by the Centre made one wonder where the dividing line came in between domestic and industrial. It would appear that all those processes, of whatever nature, for which it was necessary to sell gas at a lower price than the standard, were termed industrial. The organization embodying the setting up of the Industrial Centres and the pooling of information throughout the country spoke well for the virility of the Industry to-day. This development had taken place in a very short time, and it made one wonder what the position of the Industry would have been to-day if the potentialities of cheap gas had been realized earlier. The very diversity of industrial uses was, to his mind, the strength of industrial gas sales. He felt that an industrial load which was distributed throughout the town over a large number of different industries was far more likely to prove a stable and economical load than one which was dependent entirely upon the prosperity of any single firm. In his area they had lately negotiated an industrial load of a type which was not mentioned in the Author's Paper—*i.e.*, the heat treatment of the various processes in a rubber factory. The method of calculating the running costs of central

heating installations, as mentioned in Enquiry 10, was very similar to his own, which had proved approximately correct in practice, although, as the Author had shown, the costs of different installations varied considerably. He would stress the great advantage to the smaller units in the Industry of a Centre such as the Liverpool Centre. These Centres enabled information and experience to be placed in the hands of the Local Company, which obviously would be entirely out of their reach if they had to operate independently, and he considered them a very important factor in the organization of the Industry. That the Liverpool Centre had been able to deal with the various types of enquiry mentioned in the Paper was, he considered, a tribute to Mr. Lupton, and the organization he had built up. He was sure the Paper would inspire all present to further efforts in the development of the industrial load in their own districts.

The Author's Reply.

Mr. LUPTON, replying to the discussion, referred to the point raised by Mr. Shaw respecting the noise from a boiler. One method of subduing the annoyance to some extent was to reposition the burners. A slight movement backwards or forwards might diminish the noise. There was such a thing as resonance in boiler tubes, and Mr. Shaw might get his burners in such a position as to come into the wavelength of the tube. Another step which could be taken was to do something with the foundations of the boiler, but probably Mr. Shaw would not be prepared to do this. Sometimes foundations had to be made a kind of floating type, in order to eliminate noise. Sulphiding of boilers might take place if the correct type of boiler was not chosen for the particular job. He had known of tinned copper boilers being chosen for boiling meat, and of scratching on the surface of the tin plating baring the copper. This was attacked by the sulphide in the product being boiled and blackening occurred. It was sometimes a difficult job to re-tin boilers. Rustless cast iron was entirely effective.

Mr. SHAW said that the metal was bower barffed cast iron.

Mr. LUPTON said that if the bower barffed cast iron had been as it should have been it should not have given any trouble. He had found that some consumers had bought second-hand tinned copper boilers, and in some cases they had gone black at once. He thought there was a possibility that the question of subscription would be considered soon by the national bodies. Mr. Booth had mentioned a 400 million undertaking, and a subscription of £10. He did not know where he got the £10 from, but the subscription in the majority of Centres was 2s. 6d. per million, and 1s. 6d. each million over 500 million cu.ft. There was one Centre in the country which started at a rather low figure, and still maintained it. Mr. Booth might possibly have that figure in his mind; but for the majority of Centres the subscription was 2s. 6d. per million.

He wished to congratulate Mr. Gunn on the Yorkshire Centre. A membership of 92% was highly creditable. He had been concerned with several conversions of a naphthalene tank for a fire-lighter. In each case they had taken the existing tank of the fire-lighter manufacturer. In two cases they were of cast iron, and in the third case a steel tank. In the three cases flat-flame burners had been used in such a position that the flame was well below the bottom of the tank. In each case the tank had been jacketed and a thermostat applied. One tank had been in use for four years and there had been no trouble of any description. It was necessary to be careful and avoid too localized heating.

In regard to the cost of coke it was found in Liverpool—as was stated in the Paper—that in the majority of installations put in where a coke-fired boiler had previously been in use the increased running cost was in the region of 40%, for gas, at 4½d. There had been cases, as mentioned also in the Paper, where the cost had been double the original cost of coke even with gas at 4½d., but in those cases particular care had been taken in the operation of the coke-firing job.

A hearty vote of thanks was accorded to Mr. Lupton for his Paper on the proposition of Mr. H. B. HALLIDAY (Wallasey), seconded by Mr. C. BATEMAN (Harrogate).

Stretford Complains Against Coal Prices

Appeal to Committee of Investigation

The suggestion that increased prices of coal would cause industrial concerns at Trafford Park, Manchester, to revert from the use of gas to imported fuel oil was made to the Midland (Amalgamated) District Committee of Investigation under the Coal Mines Act at Sheffield on Friday, Oct. 21, when it sat to enquire into a complaint by the Stretford Gas Board against the price sought to be charged for washed slacks.

The members of the Committee present were Mr. Harold Rhodes (Chairman), Major A. J. Gainsford, and Mr. J. Hall. Captain Cooper Parry was absent owing to illness, and Mr. W. B. Woodhouse was also unable to attend, but both parties concerned in the case agreed that it should be heard by the gentlemen present, and the Chairman stated that the full notes of the enquiry would be submitted to the other members, so that the decision would be that of the full Committee. The Chairman also mentioned that it is intended to divide the District into two, with a chairman for each committee and probably an increase in the number of members, so that quorums would be more easily obtained.

Mr. H. Royston Askew, Barrister (instructed by Messrs. Reg. Clayton, Castle & Co., Radcliffe), appeared for the Stretford Board: and Mr. Jacques Abady, K.C., and Mr. Geoffrey Veale (instructed by Mr. Owen V. Smithson, of Leeds) were for the Executive Board of the Midland (Amalgamated) District Coal Mines Scheme.

Mr. ASKEW said the complaint was in respect of three quotations for the renewal of contracts for washed slack, from Yorkshire Main, Hickleton Main, and Denaby Main collieries. In the case of Yorkshire Main the price, delivered, under contract, from 1935 to 1937, was 15s. 4d. In the contract for August, 1937, to August, 1938, this was raised to 21s. 10d., an increase of 6s. 6d., and it was now sought, in the contract for the period ending August, 1939, to increase that price by a further 1s. The pit prices were respectively 8s. 8½d., 14s. 7d., and 15s. 7d. In the case of Hickleton Main, the first price was 15s. 3d., increased in 1937 to 21s. 10d., and a further increase of 1s. was now sought: the pit prices being 9s. 1d., 15s., and 16s. For Denaby Main slack the old price was 15s. 1d., increased in 1937 to 20s. 3d., and an increase of 2s. 4d., to a total of 22s. 7d., was now sought; the pit prices being 9s. 5d., 13s. 6d., and, as now proposed, 16s. 1d.

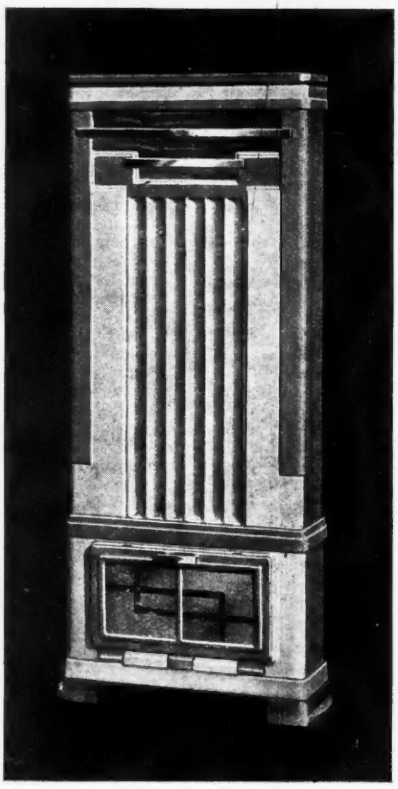
The coals were washed slack. They were not coals of the best quality, and were not of equal quality as between themselves, but it was sought to charge a substantially uniform price for all three. He submitted that if the Stretford Board had to pay these increased prices very serious consequences would follow. The Stretford Gas Board, constituted by Act of Parliament in 1922, was not a profit-making concern. Its policy had been to keep its finances on an even keel, and it had made no contribution to the rates of its constituent members and no precepts upon them. Each year it must make a budget, and if it foresaw that its income would exceed its expenditure it must make a reduction in the price of gas.

When it started operations, a large number of industrial processes were being carried on at Trafford Park, using various heating processes, and the majority of the manufacturers concerned were employing imported fuel oil for the purpose. Gas offered certain advantages for the purpose of gaseous firing, and was therefore a desirable agent to use if the price was competitive against fuel oil. The Stretford Board had made great efforts to develop the use of gas by industry, and, whereas the gas sold to industry during the year ending March, 1924, was 166 million cu.ft., it had risen, in the year ended March, 1938, to 700 million cu.ft. The coal carbonized had risen from 50,000 tons to 100,000 tons. Of the increase, about 41,000 tons represented additional coal carbonized to supply gas to industrial consumers. In other words, they had created a new demand, in the form of gas, for 41,000 tons of coal a year, and they had displaced fuel oil for those purposes.

That had only been possible because they had sold cheap gas. In 1938, the average price charged to the industrial consumer was 3·7d. per therm. The effect of the coal marketing schemes had been to raise the price of coal, and they had been compelled to raise the price of gas. The result had become very serious. They had had a very large number of complaints from industrial consumers that, if the price of their gas was raised any more, the point had come when they must turn back to fuel oil, the price of which had remained substantially level. In the case of one industrial consumer, if 1s. a ton was put on the price of coal, the additional cost of his gas, under the sliding scale in operation, would be £1,000 a year. If the price of coal was advanced, they would not get new industrial consumers with whom they were negotiating, and they would lose existing sales of gas: an important outlet for coal would be replaced by imported fuel oil; and the interest charges of the Board would have to be spread over a lower output, which must tend to increase the price of gas.

During the period in which they had already had to bear higher coal costs, they had had the advantage of higher receipts from

The Ideal Gas Heater for



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sales of coke, but now the coke market had fallen and it might very well fall further.

Prior to the introduction of the coal schemes, the difference in the qualities of coals had been reflected in the prices charged for them, but now the collieries were trying to make them pay the same price for an inferior coal as for a good coal. Denaby Main was inferior, as gas coal, to Yorkshire Main and Hickleton Main. For twelve years they had been buying Hemsworth washed slack, which was a very well-known coal of good quality, and they had recently renewed a contract for that coal, for the year ending September, 1939, at 22s. 7d. delivered, which was exactly the same price as Denaby. The pit price was 16s. 3d. as against 16s. 1d.—there was a factor's margin of 3d. The three coals now in question were worth, to the Stretford Board, 1s. 6d. to 2s. 6d. a ton less than Hemsworth.

Referring to the state of the coal trade, Mr. Askew submitted that, as there were not now the same boom conditions there had been, this was not the time when consumers should be asked to pay more for their coal. He should have thought it was the moment when consumers would have been justified in demanding a decrease.

Mr. ABADY: Your submission is that if the demand for coal has been reduced that should lead to a reduction in the selling price?

Mr. ASKEW: At a time when the market conditions have changed so much from those in which these heavy increases were put upon us, they do not warrant an increase of price. Mr. Askew went on to say that many collieries had large coke oven interests. He thought he was right in saying that the coal that they sold or transferred to their coke ovens was outside the purview of the Coal Selling Scheme. It was an advantage for a colliery to sell coal cheaply to its coke oven plant and thereby compete with cheap coke against gas undertakers. If the price of coal sold to a gas undertaker was kept up, and the price at which it was transferred by a colliery to the coke ovens was kept down, the gas undertaker was hit both ways.

Mr. ABADY objected to this point being made, first on the ground that it was not raised in the objections, and secondly that it was based on a complete fallacy, as the price of coal used for internal purposes was in fact regulated.

The first witness was Col. *W. M. Carr*, Managing Director of the United Kingdom Gas Corporation, Ltd., formerly Engineer and General Manager to the Stretford Gas Board, and now its Consulting Engineer. He said the increase in the Board's industrial sales, from 166 to 696 million cu.ft., had taken place mostly in the last five years. There was a substantial increase prior to that; then, in 1931-2, there was a fall, due to the Ford Company leaving Trafford Park; and that business was shortly afterwards recovered in other directions. When he joined the Board in 1922 he appreciated that there were great possibilities in the highly industrialized area of Trafford Park. He was aware that, by the nature of the businesses, very large quantities of oil were being used, and he thought it was a desirable thing that the gas undertaking should endeavour to secure that business. He so advised the Board, and they had concentrated on securing that business, with very considerable success. He set up a special department to deal with that particular matter, and he believed they had rendered extraordinarily useful service to the industrialists. Their service had extended to domestic means of application. The average price of gas for industrial purposes during the last completed year was 3·7d. per therm. In practically the whole of the contracts for industrial consumption there was a coal clause which provided for an increase in the price of gas of 0·1d. per therm for each complete 6d. per ton variation in the price of coal from the average price that the Board were paying at the time the contract was made. The average cost of coal per ton for the years ended in March had been: 1935, 15s. 6d.; 1936, 15s. 10d.; 1937, 16s. 7¼d.; 1938, 18s. 3½d.; and, for the half-year just ended, 21s. 0¾d. There was a time lag in the effect of the increases, and no variation was made in any of the industrial contracts until the latter half of the year ended March, 1938, when increases were made to the industrial consumers, and also to domestic consumers.

The largest industrial consumers had strongly objected to the increases. They had pointed out that the use of gas was rapidly becoming uneconomic, and that they were seriously considering the use of fuel oil. Metropolitan-Vickers Electrical Company, Ltd., who were the largest industrial users, said, in a letter dated Aug. 30, 1938, "We are very seriously concerned at the substantial increase in the cost of our supplies due to the operation of the coal contract clause. When we decided to close down our producer plant and also to convert our oil-fired furnaces to town gas, we were largely influenced by the price of gas at the time this decision was made, but now that the cost has risen to its present level the use of gas for furnaces is rapidly becoming uneconomic, and we are seriously considering returning to the use of oil fuel." Turners Asbestos Cement Company, on March 15, wrote that they were very much concerned by the heavy increase in the price of gas due to the operation of the coal clause. D. Anderson & Son, Ltd., on Aug. 12, said: "Any increase in cost would very definitely compel us to reconsider the question, and may compel us to revert to fuel oil firing." The Southern Oil Company, who refined vegetable oils, and who converted their oil heaters to gas firing, wrote on Aug. 11: "Gas at its present high price is not strictly competitive with oil. As you are aware, our heaters can quite easily be fired by oil. If we are called upon to pay still higher rates for our gas, due to the operation of the coal clause, we shall have no hesitation in reverting to the use of oil in our factory." All these consumers took over 50 million cu.ft. per annum, and there were a great number of other letters.

If there were these further increases in price, the undertaking would no doubt lose the business which they had striven hard to maintain. They had now on hand a negotiation for displacing the only big fuel oil works remaining in Trafford Park, which used 4,000 tons of oil per annum. If they succeeded in that, the additional 41,000 tons of coal which they now used would be increased to 60,000. When the Board recently planned a great extension of the works, they expected that they would have to pay an increased cost for coal, but they did not anticipate that that would be more than 4s. or 5s., whereas the increase now proposed would bring it up to more than 7s. So far they had only renewed one contract this year, with Hemsworth. It was the fear that the proposed price might be the basis of all other contracts, and that they would lose the substantial industrial load, that prompted them to appear before the Committee. The increase was out of all relation to increases which had been made in other gas coals. He was connected with a number of Yorkshire gas companies, and the highest increase in pit price that they had on gas nuts, for 1938 as compared with 1935, was 4s. 7d., and the lowest 2s. 8d., against the proposed 7s. 4d.

Coke was at its highest price in 1937. For the year ended March, 1935, they sold 38,407 tons of coke and breeze, at an average price of 15s. 10d.; 1936, 43,000 tons, at 16s. 1d.; 1937, 50,480 tons, at 19s. 11½d.; 1938, 60,788 tons, at 24s. 3d. During the last six months, coke prices had fallen, on the average, 3s. per ton. Tar had also shown serious decline in the last six months. While coal prices had been increased under the selling scheme, the factors had taken a good deal bigger commission.

Before the selling schemes came into effect the prices were: Yorkshire Main, 15s. 4d.; Hickleton, 15s. 3d.; Denaby, 15s. 1d.; Hemsworth, 17s. 10d. Hemsworth was thus 2s. 6d. a ton more than any of the others, and it was worth 2s. 6d. more to the Board. It was a first-class coal.

Mr. ASKEW: If the proposals are confirmed, the prices will be: Denaby, 22s. 7d.; Yorkshire Main, 22s. 10d.; Hickleton Main, 22s. 10d.; Hemsworth, 22s. 7d?—Yes.

You would actually be paying more for a clearly inferior coal?—Yes.

Mr. ABADY: Coal that you are going to prove is inferior?

Col. *Carr*: The word "inferior" is perhaps not quite the right word to use in that connexion. "Coal which is of less value to us" is the point I would like to make.

The CHAIRMAN: That is, having regard to its calorific content?

Col. *Carr*: Having regard to what we can get out of it. Not so much calorific content as the gas yield. He went on to give particulars as to the Board's system of analyzing the coals and arriving at their relative value. If Hemsworth slack was worth 22s. 7d. per ton to them, then, taking the difference in thermal yield and in inert content, Yorkshire Main was worth 1s. 2d. less; Hickleton Main, 1s. 6¼d. less; and Denaby Main, 2s. 6d. less. Yet it was sought to charge them, for those three coals, substantially the same that they were paying for Hemsworth. He suggested that it was significant that the renewal price for the Hemsworth contract was fixed by the coal selling agency after the price of the coals which were now in dispute had been fixed. They had no complaint about the price for Hemsworth, except that they thought it was as much as could possibly be put upon it.

Mr. ASKEW said the Executive Board suggested that the price of washed smalls was severely depressed before 1937.

Col. *Carr* replied that it was depressed at a time perhaps prior to the boom in the steel trade, but when the Gas Board's prices for 1937 were fixed the demand was very much stronger than it was to-day, by reason of the better steel trade demand and coke oven demand. He did not agree that the cost of timber was going up.

Cross-examined by Mr. Abady, witness said the Gas Board's complaint was made in a letter to the Secretary of the Executive Board dated Aug. 4, 1938. In that letter it was stated that the price asked for the renewal of the three contracts in question was 22s. 10d. That figure was accurate in respect of Yorkshire Main and Hickleton Main, but he was informed that it was inaccurate in regard to Denaby Main.

If you could buy 102,000 tons of coal of the same quality as Hemsworth, or a quality that would suit you as well, 22s. 7d. is something that would not have these dire effects on your industrial consumers?—I don't say so. He agreed that the difference in price between Hemsworth coal on the one hand, and Hickleton Main and Yorkshire Main on the other, was because

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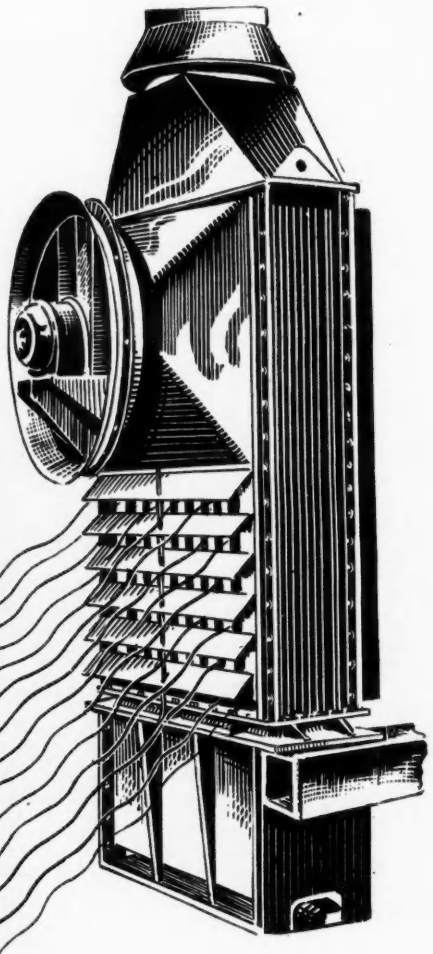

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the factor's price, over which neither the coalowners nor the Committee had any control, was 3d.

If you bought all your coal at 22s. 7d., are you representing to this Committee that you would lose the 45,000 tons of coal because there would be this turnover to oil fuel?—Yes, possibly.

Then why have you not complained of the other coal?—Because we assumed that the difference in value would be maintained. The factor affecting us is the average cost of all coal that we buy.

Then it is not a question of price, but of quality?—It is a question of price and quality. You cannot dissociate the two.

Asked why he had bought Yorkshire Main and Hickleton Main if they were less valuable than Hemsworth, witness said the supplies of washed smalls were limited. He could not buy all Hemsworth. He had bought a large quantity of washed smalls from Manchester collieries, and he also bought in Yorkshire. He had to make up his supplies from the best qualities he could find.

So far as this complaint is concerned, what you are complaining about is an increase of 1s.?—It is an increase of 2s. 4d. in one case, and 1s. in the other two.

The Denaby is 2s. 4d.?—Yes.

And it is 2,750 tons, isn't it; not 3,000 as stated in your complaint?—They reduced it after the original contract.

Do you tell the Committee that if you have to pay 22s. 7d. for 2,750 tons of Denaby coal, instead of paying 20s. 3d. for 3,000 tons as you did between June, 1937, and May, 1938, that that is going to cause any appreciable alteration in your costs?—Yes, because I anticipate that if the Board agree to pay that, and do not represent this case to the Committee, all other coals would be advanced in the same ratio when the contracts fall due for renewal.

Are you saying that an increase of 2s. 4d. on 2,750 tons of Denaby coal in twelve months is going to make any appreciable difference to your total cost of producing gas?—It is going to make exactly that difference in so far as it affects the average cost of coal.

Colonel Carr said the largest industrial consumer, who took 160 million cu.ft. a year, was paying the increase of ½d. per therm. Up to March 31, 1938, his average price was 3·24d. For the half-year ended Sept. 30, 1938, it was 4·30d. He had not gone back to oil, but he threatened to. Their first talk was verbal, but when the Board lodged their appeal they asked the firm to put their complaint in writing. He handed their letter to Mr. Abady.

Questioned with regard to the annual statement of accounts of the Gas Board for the year ended March 31, 1938, witness said the results in that year were very much better than in 1937, for the reason that they got an extraordinarily high price for coke, and they did not feel the effect of the increased price of coal. They had increased the price to the ordinary consumer by ½d. per therm from March 31, 1938, which would represent a figure of nearly £6,000. In 1938 the gross cost of coal was 3·58d. per therm sold, and the receipts from residuals were 3·39d., leaving the net cost for fuel 0·19d. In 1937 the net cost of fuel was 0·56d., and in 1936 it was 0·69d.

In other words you have, despite the rise in the cost of coal, reduced your net cost per therm by ½d.?—Yes, because of the abnormal condition in the residual market, and because we have not paid the full price of coal that is now fixed under existing contracts. It will be a very different story this year.

Further examined by Mr. Abady, Colonel Carr said they had spent capital out of revenue. In 1938 they spent the equivalent of 0·68d. per therm; in 1937, 0·22d.; and in 1936, 0·11d. An amount equivalent to the difference in the net cost of fuel—a halfpenny—had been spent extra on capital out of revenue between 1936 and 1938. The gross balance on revenue account for 1938 was £68,300, which was more than in 1937 or 1936. After payment of interest, sinking fund, and income-tax, there was a credit balance on the net revenue account for 1938 of £18,023, which compared with a debit in 1937 of £5,454, and a credit in 1936 of £2,444.

Mr. ABADY: Do you ascribe all this betterment of the conditions of the Stretford Board, in a time when they were paying higher prices for coal, entirely to the fact that you were getting more for your residuals?—Yes, to the abnormal price which we were able to obtain for residuals.

Witness was questioned by Mr. Abady, and afterwards by the Chairman, as to whether there was any ground for giving special treatment to the Stretford Board. He said he thought it was in the interests of everybody concerned that a gas undertaking which had a potential industrial load should have special consideration. Colliery revenues would go down in greater proportion if they did not make a concession than if they did. At the prices they were paying to-day, it was possible to do business, but if those prices were going to be increased, even by 1s. or 2s., it was going to be very difficult, having regard to the present price of oil. If the price of oil went up, they could afford to pay more for coal. He thought the Board ought to give them preferential treatment in order that they might capture this market.

Mr. *E. Watson Smyth*, Managing Director of Taylor Bros. & Co., Ltd., Trafford Park Steel Works, Manchester, said in 1935 the Company were installing an annealing furnace, and had practically decided that it should be fired by fuel oil. The only possible alternative was gas. The Stretford Gas Board approached them, and they decided to use gas. The price of the gas was to be 2·4d. per therm, subject to a coal clause, and that compared favourably with the price of fuel oil. The annual amount of gas they used had risen to about 66 million cu.ft. per year. Under the coal clause the cost of gas had now been increased to 3·41d. per therm, or about 42% more than the original price, while the price of fuel oil had remained practically the same. The difference in price between town gas and fuel oil had risen from 0·33d. in favour of oil to 1·253d. In view of that, the firm were seriously considering the question of converting their furnaces to fuel oil.

Replying to Mr. Abady, witness said the firm had their own producer gas, with which they fired some annealing furnaces. They made the gas from coal, the pit price of which was now 16s. 8d.; in 1934 it was 11s. In 1934-5 the price of fuel oil was 0·395d. per lb.; now it was 0·41d. In the annealing furnaces they put railway tyres and wheels. They made the steel themselves, from scrap and pig iron. For pig iron, in 1938, they paid twice what they did in 1934. They had three big town gas annealing furnaces, and a number of small ones.

Asked whether, assuming a certain price was necessary to give the miners a decent wage, he still expected to get his heat units cheaper than he otherwise would do, Mr. Smyth said his sympathies were with the miners, but he also had to think of finding work for his own men, and as a commercial man it was only natural that he should buy in the lowest market.

The enquiry was adjourned until Nov. 4.

Interesting Exhibition at Wigan

Lectures on Cooking and Beauty

The Mayor and Mayoress of Wigan (Councillor and Mrs. E. Ball) were present at the opening of the Wigan Corporation Gas Department Demonstrations in the Court Hall, Wigan, on Oct. 17.

Demonstrations were held every afternoon and evening throughout the week. A series of lectures on cooking and beauty were given by Miss M. E. Taylor, Professional Cook's Certificate, N.C.D.S., M.C.A., of the Radiation Research Kitchen, and included talks on diet and exercise, meal planning for children, and recipes.

Alderman J. Horne, Chairman of the Gas Committee, presided at the opening ceremony. Among others present were Mr. J. Monks, Engineer and Manager, and Mrs. Monks.

A View of the Gas Display.

The Mayor said he was very pleased to open the exhibition and to support Alderman Horne. For many years Alderman Horne had been interested in all the departments of the Corporation, all of which were very efficient. This week the public would be given an opportunity of seeing what the Corporation did for them. The Gas Department in Wigan was as efficient as any in the country. The sole object of the Corporation was to provide commodities as cheaply as possible, and the Gas Department provided the best quality gas as cheaply as possible.

Councillor Mason said that gas was a healthy and helpful thing, and he hoped that everyone would show great interest in the exhibition.

A vote of thanks to the Mayor and Mayoress was proposed by Councillor Lynch, of Standish. Mr. Monks seconded the vote of thanks, on behalf of the Gas Department.

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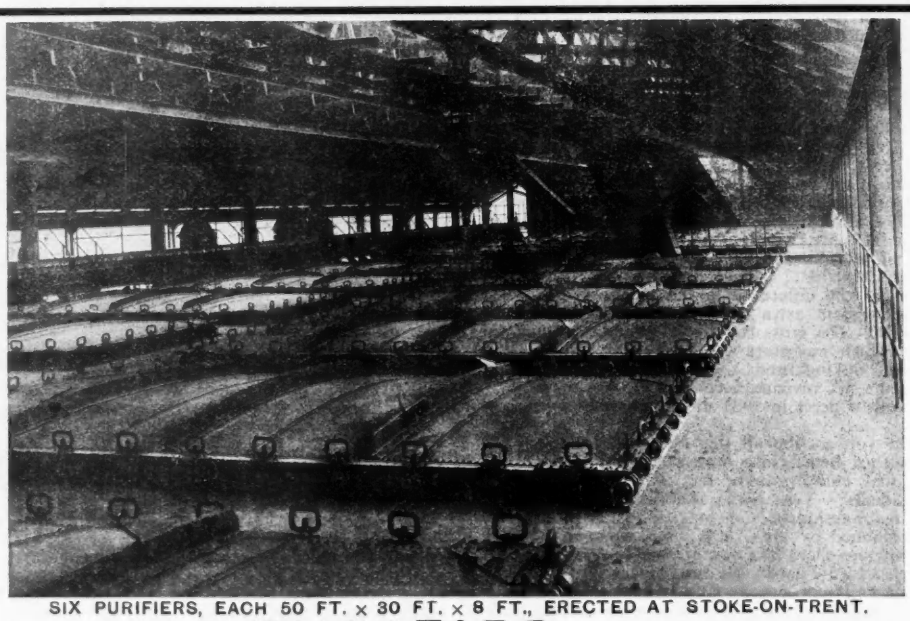

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The Nantwich Special Order

Board of Trade Enquiry

The question of protection for road authorities in regard to gas undertakings and whether the latter should bear the cost of removal of gas mains at the request of the former in consequence of road improvements, was raised in a rather special form at an Enquiry held at the offices of the Board of Trade on Thursday, Oct. 20, into an application by the Nantwich Gas Company for a Special Order authorizing it to take over the gas undertaking of the Nantwich Urban District Council. The Company was represented by Mr. R. H. Studholme (Solicitor), and the Cheshire County Council, which was the only opponent, was represented by Mr. H. Royston Askew (Barrister). The Inspector was Mr. F. W. Wallace (Barrister).

Mr. STUDHOLME, in explaining the circumstances in which the Special Order was promoted, said the Nantwich Gas Company proposed to acquire the Nantwich Urban District Council's gas undertaking and to extend the area of supply, making a total of some 100 square miles. The capital of the Company would be £70,000 with 50% borrowing powers, and it had been agreed with the local authorities concerned that the basic price should be 12d. per therm and the differential in the outer areas 2½d.

Mr. H. ROYSTON ASKEW, for the Cheshire County Council, said the basic price and differential were important matters from the point of view of the consumer, and naturally the County Council expected the Company to justify to the Board of Trade the figures that were proposed. That was the usual practice.

Mr. STUDHOLME pointed out that the Urban District Council raised no objection; indeed, the figures of 12d. and 2½d. per therm had been agreed between the consultant who advised the District Council and the consultant to the Company, but, of course, the facts on which the figures were based would be placed before the Board of Trade.

There were, he continued, three matters on which the Cheshire County Council objected—viz., the clause with regard to revision of price, the clause relating to laying pipes for ancillary purposes, and the proposal of the Draft Order to repeal all the existing Acts and Orders which the Nantwich Council had, and to embody all the powers of the new Company in the present Order.

So far as the question of revision of price was concerned, the Company did not attach a great deal of importance to this provided powers for revision of price were made reciprocal. The County Council proposed that any local authority should have the right to apply to the Board of Trade for a reduction of price and the Company would agree to this provided some time limit was inserted before which the first of such applications could be made and also that the Company had the reciprocal right to apply to the Board of Trade for an increase in price under similar conditions.

(Later in the proceedings it was agreed that any local authority should have the right to apply after five years and that the Company could also apply in a similar way for a revision of price.)

Ancillary Pipes.

With regard to ancillary pipes, the County Council asked that powers should only be granted to lay these in the vicinity of the gas-works and a distance of something like 200 yd. had been mentioned. In view of the extension of the area of supply and the necessity which might arise for boosting up the gas pressure, such a distance was useless, as it might be essential to put in a booster some miles away and run pipes for the purpose. Moreover, the County Council had a valuable power of veto inasmuch as the clause relating to this matter stated that ancillary pipes should not be laid without the consent of the highway authority, which must not be unreasonably withheld. Therefore, it was difficult to imagine why the County Council required anything further. The position was complicated by the fact that it was half a mile from the existing gas-works to the nearest point in the outside area, and it was in the outer area where the necessity for boosting up the pressure would arise.

Continuing, Mr. Studholme said the really seriously contested point by the Cheshire County Council was the proposal to repeal the existing legislation so far as the Nantwich Urban District Council had secured Acts and Orders and replace it by the proposed Special Order. The point arose especially in connexion with Special Orders obtained in 1912 and 1932 and concerned the protection for the County Council with regard to altering the position of gas pipes in the highways and who should pay for such alterations when they were made at the request of the County Council as the highway authority. There was, said Mr. Studholme, a fundamental point of substance in this matter and he submitted very strongly that although the County Council asked that the powers in the Special Orders granted to the Urban District Council should remain unrepealed, what they were asking for was the right to interfere with the works of the new Company and to make the Company pay for any cost involved in such interference. Whether the County Council asked for these powers in respect only of the existing Council's area or the area proposed by the new Company he had not been able to discover.

Mr. ASKEW said the County Council was asking for nothing more than a continuation of the existing protection which the County Council had, and this was in respect of the area which had been served by the Nantwich Urban District Council's gas undertaking. In other words, they were asking that their existing rights should not be taken away.

Mr. STUDHOLME said the clause which the County Council did not wish to have repealed, and which provided that the Urban District Council's gas undertakings should bear the cost of the alteration or removal of any mains due to road improvements being carried out by the County Council, was an agreed clause between the Urban District Council and the County Council, presumably as the price of buying off the opposition of the County Council, a thing that was commonly done, and now it was suggested that the new Company should have that clause imposed upon them compulsorily. It might be said that the Company, as successors in title to the gas undertaking of the Urban District Council, should take over the liabilities involved in that clause, but he did not accept that argument for a moment. It might also be said that the clause was justified on its merits, in which case he would argue the matter before the Inspector. Having regard to the fact that a new Company was being formed and would be controlled under a new Special Order, he contended that the Company inherited no powers and inherited no obligations from the Council, and inasmuch as the Draft Order repealed all the existing Acts and Orders held by the Council, there was no reason why one particular clause should be excepted.

Not a Party to Previous Agreement.

The Company was not a party to the agreement between the Urban District Council and the County Council on this matter and, he said, he attached a great deal of importance to that point. The Company was not a party to the Urban District Council surrendering to the demands of the County Council, and it received no *quid pro quo* for so doing. Another point which arose in connexion with the application of the clause in question to the whole of the area supplied by the Nantwich Council's gas undertaking—as it did under the Nantwich Council's Special Order—was that there was good reason for saying that it was accepted by mistake. At the time, the Nantwich Council was one of those misguided authorities who thought it could promote legislation without seeking the assistance of Parliamentary Agents. Originally the powers of the County Council to call on the Gas Undertaking to meet the cost of alterations to pipes caused by road improvements only applied to a very small addition to the Urban District Council's gas area, but in 1932 a new Order was applied for by the Clerk to the Council, and the County Council took the opportunity of imposing the clause on the whole of the gas limits. The Manager of the gas undertaking, who was still with it, would say that he was never consulted by the Clerk with regard to this Order, and although the Clerk himself was not now with the Council it was fairly obvious that he himself did not appreciate what had been done or he would never have agreed. This was another reason why he contended the Company should not be compelled to give the County Council the same form of protection which it now had in the Council's gas area.

Mr. H. ROYSTON ASKEW, for the County Council, said he would submit that the merits of the existing protection were not an issue in the present Enquiry.

Mr. STUDHOLME said it was not the practice of the Board of Trade nor of Parliament to give protection of this kind to road authorities unless it was by agreement, and the most recent case was the West Yorkshire Gas Bill, when Parliament said that the County Council must pay the cost of the removal of any mains where the alteration had to be made at the request of the County Council on account of road improvements. Another argument he wished to put forward that where there was no question of inheritance of powers—and he contended there was not in this case—the Gas Undertakings Act of 1934, which said that certain gas undertakings which were unauthorized should be required to ask for a Special Order and become authorized undertakings, laid down certain things which must be included in such Special Orders but there was no mention there of any special protection for highway authorities or railways. Clearly the inference was that sufficient protection was afforded by the Gasworks Clauses Act, and that was the view he put forward in this case. Indeed, he would go farther and say it was *ultra vires* for the Board of Trade to

put in any protective clauses of this character which were not agreed between the parties.

Mr. *George Evetts*, Consulting Engineer, and adviser to the Nantwich Gas Company, said that on the question of the basic price he had conferred with Mr. Arthur Valon, the Consulting Engineer to the Urban District Council, and had agreed 12d. per therm. Originally, the Company had proposed 13·5d. per therm based on gas supplied of 400 B.Th.U., but it was represented to him that in fact the gas had a calorific value of 440 B.Th.U., and that the new Company could safely declare that calorific value. This meant that the price now being charged was effectively 10% less than the nominal price, and in these circumstances the figure of 12d. per therm was agreed for the basic price. The actual price of gas was 15d. per therm but after being adjusted for calorific value it was 13·5d. per therm and on this figure he advised that the differential in the outer area should not be more than 2½d. per therm, otherwise the price would be so high as to handicap development. At the same time, the differential could not be less than 2½d. if the Company was to develop in the outer areas, as there were villages where it would hardly be possible to supply economically with that differential and there were others where 2½d. would not be sufficient at present.

Speaking with regard to the protection asked for by the County Council and the question of inheritance of powers of this nature when an undertaking was transferred, Mr. Evetts said there were quite a number of instances in which clauses of this kind had not been inherited by the new authority and it was not an established practice that powers should be inherited in the manner suggested by the Cheshire County Council.

He supported what Mr. Studholme had said as to the possibility of a crippling expenditure being placed upon small gas undertakings if they were compelled to meet all the cost of altering mains due to road improvements.

In answer to Mr. H. Royston Askew,

Mr. *Evetts* said the Nantwich Gas Company was controlled by the Severn Valley Gas Corporation.

Mr. *Harold Vernon*, Manager of the Nantwich Gas Undertaking, said he had been in that position since 1918. He confirmed what Mr. Studholme had said as to the circumstances in which the protection for the County Council was inserted in the 1932 Order, and after saying that the clause in question was not brought to his notice added that he was quite sure the late Clerk to the Council did not appreciate the effect of the clause. He also stressed the point that without some time limit with regard to revision of the differential, it would hamper development owing to the difficulty of making reliable estimates in view of a possible reduction in the differential before any particular extension became economic and the general effect would be that gas would not be extended to certain areas whereas otherwise it would be. The Directors would have to be very cautious.

This closed the case for the Nantwich Gas Company.

Mr. H. ROYSTON ASKEW then addressed the Inspector for the Cheshire County Council but did not call evidence, and asked that the existing protection which the County Council had in the area supplied by the Nantwich Council's gas undertaking should be preserved under the new conditions. There was no evidence that the protection had been a burden on the Council and he said he knew of no Parliamentary authority for doing what was proposed in this case. A bargain had been made between the Urban District Council and the County Council and it was only right and proper that this bargain should not be disturbed. If Parliamentary bargains of this nature were to be torn up because somebody took over the gas-works from the original owner it would be almost impossible to carry on Parliamentary proceedings at all. The bargain was made only six years ago and the County Council was brought into these proceedings because a successor in title wanted to tear that bargain up. The only reason for making any alteration of the kind suggested was a change in circumstances but nothing had been said to justify such an argument, and, indeed, it had not been put forward. If the Board of Trade adopted the suggestion of the promoters of this Special Order they would be setting up a new principle which could be made to apply to all sorts of things and there would be nothing short of chaos.

Speaking on the question of pipes for ancillary purposes, Mr. Askew said the Company was seeking powers to lay pipes for all sorts of purposes within its area of supply. It had come out in the proceedings that the Nantwich Company was part of a vast organization and that fact might have some relevance to the clause dealing with this matter. Nobody quite knew what such a large organization would do but on the basis of past practice he urged that the distance in which pipes for ancillary purposes might be laid should be limited to 200 or 300 yd. from the works.

Mr. *Evetts*, in answer to the Inspector, said it might be necessary to lay ancillary pipes a distance of several miles from the gas-works in order to boost up the pressure, and even if a distance of 400 yd. from the works was inserted in the Order, that would be useless for the purpose.

The public enquiry then closed and the Inspector will report to the Board of Trade in due course.

George Wilson Gas Meters

Profits Maintained

The Second Ordinary General Meeting of George Wilson Gas Meters, Ltd., was held on Friday, Oct. 21, in Coventry.

Mr. J. H. WILSON (Chairman and Managing Director) said: The trading profit, amounting to £22,626, is almost identical with that of the previous year, in spite of the fact that the cost of raw materials and labour has been at a higher level, and that holidays-with-pay have this year been granted to all the Company's employees. In view of these additional expenses, your Directors feel that the results obtained are very satisfactory.

The fact that the trading profit has been maintained provides evidence of the economies which I foreshadowed in my speech last year when I referred to the attention we had given to the matter of improving the lay-out of the works. The burden of income-tax has once more been increased, and the National Defence Contribution has been in force for the whole of the year under review. Full provision for these requirements absorbs the sum of £7,500.

Financial Position Strengthened.

After making such provision for taxation, the profit for the year amounts to £15,126. Your Directors recommend the payment of an ordinary dividend of 15%, less income-tax, carrying forward £10,037. The carry-forward is increased by £7,665 and the financial position of the Company is thus strengthened by this amount. The fixed assets, after making generous provision for depreciation, show an increase of £2,155. As mentioned in my speech last year, we have acquired an additional plot of land adjoining the factory, and furthermore we have expended nearly £2,000 on additions to plant and tools, with the object of obtaining more accurate and more economical production, and the existing plant has been maintained in satisfactory working condition. The net liquid assets, after providing for payment of the proposed ordinary dividend, show an increase of £5,510 over the previous year.

We have acquired the business and goodwill of Messrs. Hutchinson Bros., Ltd., of Doncaster, manufacturers of gas meters, public lamps, and other gas fittings. This firm has been established for half a century, and I hope that the future will show the benefit of the connexion we have thus obtained.

Our technical research department has again made good progress, with the result that we shall shortly be incorporating with our gas meters a simple, but very effective device, which I know will make a great appeal to the scientific mind of the gas engineer.

Progress of the Gas Industry.

It is gratifying to note the progress of the Gas Industry without the assistance of Government subsidy, and it would appear that the value of gas as a fuel is being more fully realized as time goes on.

The Company has not received the benefit of any Government contracts during the year, but I am pleased to announce that our name now appears on the list of approved firms for aircraft and other Government precision work. Our plant is very well suited to such work, and I hope that this development may result in opportunities being given to your Company to increase its turnover.

We shall again be exhibiting our products at the British Industries Fair at Castle Bromwich next year. My best thanks are due to my co-Directors and to the staff and all our employees at Coventry, London, Manchester, Blackpool, and Leeds for their excellent work and co-operation throughout the year.

The Report and Accounts were unanimously adopted, and the Directors were congratulated on their wise policy in building up a substantial reserve.

Athletic and Social

Blackburn Social and Benevolent Club.

The annual gathering organized by the Social and Benevolent Club of the Blackburn Corporation Gas Department attracted a large attendance at the Jubilee Market Hall on Oct 22. Supporting the Mayor (Alderman J. Frayars, J.P.), who presented the prizes, was Mr. J. D. Ashworth (Engineer and Manager) and other officers of the Undertaking. The recipients were: The Alderman Hamar Cup in the bowls competition Mr. J. Barton, with Mr. R. Dixon as runner-up, and Messrs. R. Riley and Hindle as semi-finalists. Knockout competition (six-a-side): Team consisting of Messrs. R. Holden (captain), J. Clemson, C. Hindle, R. Walker, H. N. Dann, and W. Craig. Cricket Section: Batting prize: Mr. H. Sharples; Bowling prize: Mr. W. Jenkinson. Tennis Section: Winner, Mr. A. Windsor; runner-up, Mr. E. Culshaw; semi-finalists, Messrs. J. Dixon and G. R. Terry.

The Mayor commended the work of the social centres of public undertakings and congratulated the winners on their success.

Mr. Harry Sharples (Secretary of the Club), in his Annual Report, said the membership was 254, against 230 a year ago. During the year 35 members entered into well-earned retirement following long service with the Department, and they were happy to confer honorary membership of the Club on these old servants.

The activities of the Club had been carried on with enthusiasm and satisfaction. The section continued to organize events, and none were more popular than the monthly whist drives. The savings bank had 117 depositors, who had paid into the bank £1,148—an increase on the year. The benevolent fund also continued its work, and since its inception in 1929 it had disbursed £1,005 in sickness and death grants.

"The Gas Industry in Birmingham"

Mr. G. C. Pearson Addresses Surveyors

In an Address to members of the Warwickshire, Staffordshire, and Worcestershire branch of the Chartered Surveyors' Institution, in the Birmingham Chamber of Commerce, last Thursday night, Mr. G. C. Pearson, Engineer-in-Chief of the Birmingham Gas Department, gave a survey of the Industry in the city.

Mr. Pearson stated that Birmingham had been closely connected with the Gas Industry for over a century. The first practical use of gas was made by William Murdoch, at Soho Foundry in 1798. Nothing remained of the City's first gas-works, which were built in 1817 by John Jostling, in a street near Broad Street, still appropriately called Gas Street.

The service of a gas supply was taken very much as a matter of course by the average individual, said Mr. Pearson. In Birmingham to-day, five gas-works were continually at work. The total capacity of these was 78 million cu.ft. daily, and the storage capacity of the gasholders 56½ million cu.ft. Approximately 950,000 tons of coal were required annually for carbonization, in addition to large quantities of gas oil. The sale of apparatus during twelve months amounted almost to the value of £250,000. A total of 339 714 cookers and 182,379 gas fires had been installed, and the area covered by the supply exceeded 190 square miles. There were 3,500 persons employed in the Undertaking, and consumers numbered 338,530.

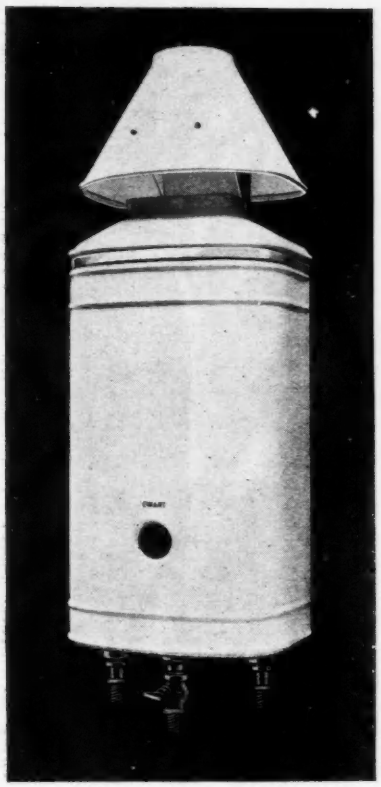
Though there had been many dislocations in the delivery of coal, caused by coal strikes and transport difficulties, the gas supply had never been known to fail in the history of the Department. It was claimed that in no other town in the country was gas applied to such widely divergent uses as in the innumerable trades at present carried on in the City of Birmingham.

Gas Undertakings' Results

Dundee.

The annual report of Dundee Corporation Gas Engineer and Manager (Mr. John Wilson), for the year ended May 15 last, states that the sale of appliances continues to be satisfactory. The number of appliances sold outright during the year amounted to 967, while 1650 were sold under hire-purchase agreements, compared with respective totals of 941 and 1,000 for the previous year. The number of privately-owned cookers continues to show an increase, and is lessening the demand on the Department for free-on-loan cookers. There are now 30,813 cookers on loan and 11,872 privately-owned cookers. For the fourth successive year the Department has had to face a rise in the price of coal. The increased cost this year over 1934-35 for coal and carburetted water gas oil is equivalent to an increase in the price of gas of approximately 6d. per 1,000 cu.ft. "No greater testimony is required regarding the stable financial position of the Undertaking than the fact that in face of these circumstances no increase in the price of gas has been necessary until the provision which has now been made in the estimates for the year 1938-39," the report adds,

EWART



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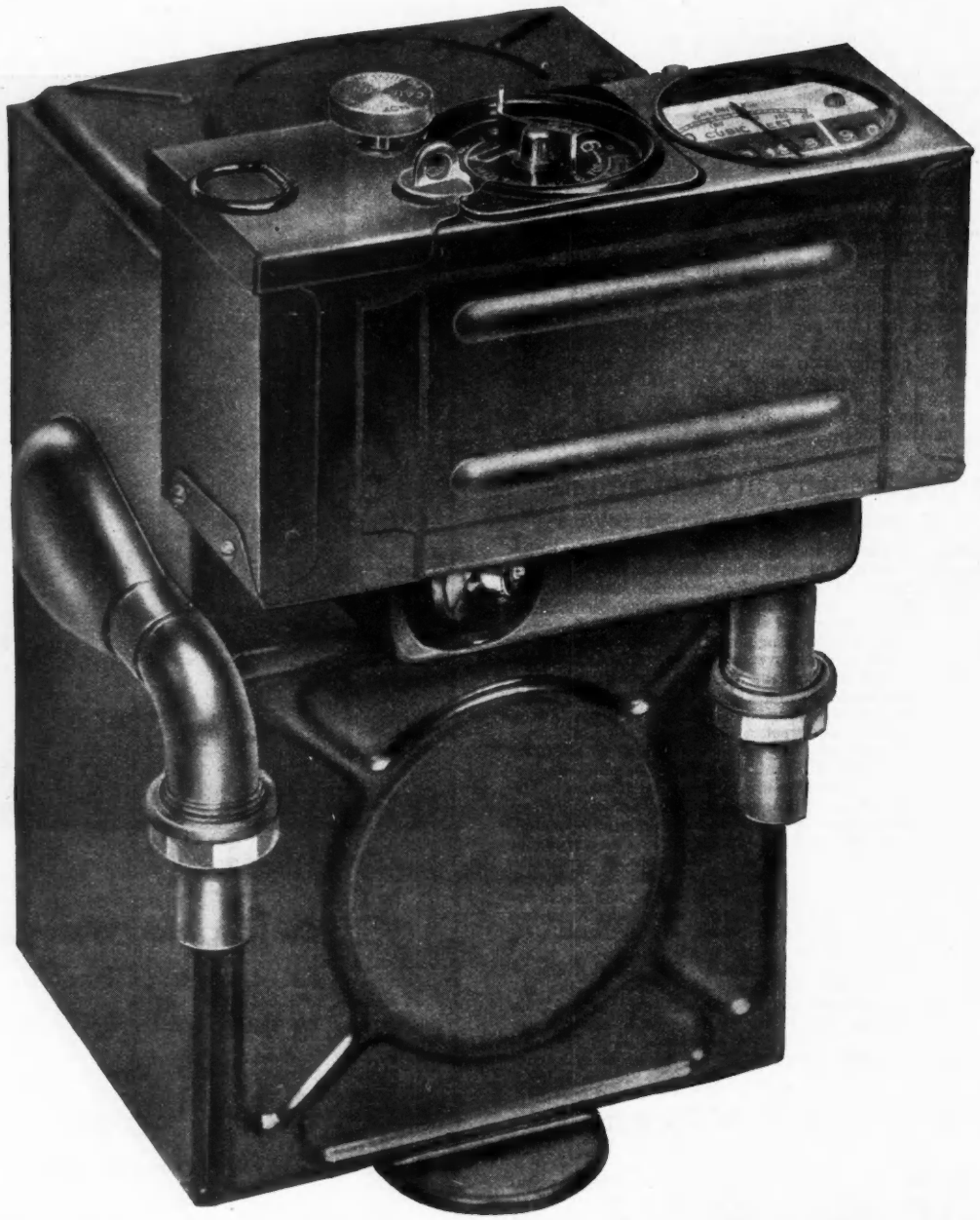

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Markets and Manufactures

Current Sales of Gas Products

The London Market

LONDON, *Oct.* 24.

There is little of interest to report in the London Tar Products market, the following being to-day's values:

Pitch, nominal at about 33s. per ton f.o.b.

Creosote, about 4⅜d.

Refined tar, 3¼d.

Pure toluole, about 2s. 3d.

Pure benzole, about 1s. 9d.

95/160 solvent naphtha, 1s. 7d. to 1s. 8d.

90/160 pyridine, 10s.

All per gallon naked at makers' works.

The Provinces

Oct. 24.

Crude Gas-Works Tar, 15s. to 20s.

To avoid misunderstanding, it is necessary to state that the above price is not claimed to represent a market value. It is a price worked out from week to week upon a system which has been used for many years as a basis for the fixing of certain contracts for crude tar of varying qualities in different areas.

The average prices of gas-works products during the week were: Pitch—East Coast, 31s. to 32s. f.o.b. West Coast—Manchester, Liverpool, Clyde, 31s. to 32s.* Toluole, naked, North 1s. 7½d. to 1s. 9d. Coal tar, crude naphtha, in bulk, North, 7¾d. to 8¼d. Solvent naphtha, naked, North, 1s. 4½d. to 1s. 5d. Heavy naphtha, North, 1s. 2½d. to 1s. 3d. Creosote, *ex* works, in bulk, North, liquid and salty, 4⅜d. to 4⅝d.; low gravity, 4¼d. to 4⅜d. Carbolic acid, 60's, 1s. 7d. to 1s. 10d. Naphthalene, £13 10s. to £16. Salts, 70s. to 75s., bags included. Anthracene, "A" quality, 4½d. to 4¾d. per minimum 40% purely nominal; "B" quality unsalable. Heavy oil: Unfiltered anthracene oil, min. gr. 1,080, 4¾d. to 4⅞d.; filtered anthracene oil, min. gr. 1,080 5¼d. to 5¾d.; heavy tar oil, gr. less than 1,080, 4½d. to 4¾d.

* All prices for pitch are now quoted on the basis of f.o.b. In order to arrive at the f.a.s. value at any port it will be necessary to deduct the loading costs and the tolls whatever they may be.

Scotland

GLASGOW, *Oct.* 22.

A slight improvement in trading can be noted but the volume of business is still insufficient to make any material alteration in prices.

Crude gas-works tar.—Actual value is about 37s. to 38s. per ton *ex* works in bulk.

Pitch is very quiet with to-day's prices round 22s. 6d. to 23s. 6d. per ton f.o.b. for export and about 20s. to 22s. per ton in bulk for home trade.

Refined tar is quietly steady at 3¾d. to 4d. per gallon in the home market. Export business is very competitive with makers' prices round 3d. per gallon in buyers' packages at makers' works.

Creosote oil.—Market is still dull at the following prices: Specification oil, 4¼d. to 4¾d. per gallon; low gravity, 5d. to 5¼d. per gallon; neutral oil, 4¾d. to 5d. per gallon; all *ex* works in bulk.

Cresylic acid.—A few odd parcels are being sold, but the general position is unchanged with prices as under: Pale, 97/99%, 1s. 4d. to 1s. 6d. per gallon; dark, 97/99%, 1s. 2d. to 1s. 4d. per gallon; and pale, 99/100%, 1s. 6d. to 1s. 10d. per gallon; all according to quality, *ex* works in buyers' packages.

Crude naphtha is valued at 5¼d. to 6d. per gallon *ex* works in bulk, according to quality.

Solvent naphtha.—Market is easy with 90/160 grade at 1s. 3½d. to 1s. 4d. per gallon and 90/190 heavy naphtha at round 1s. 1d. to 1s. 1½d. per gallon.

Motor benzole is 1s. 3d. to 1s. 4d. per gallon.

Pyridine.—90/160 grade is 8s. to 9s. per gallon and 90/140 grade is 9s. to 10s. per gallon.

Benzole Prices

These are considered to be the market prices for benzole at the present time:

	s.	d.		s.	d.	
Crude benzole ..	0	9½	to 0	10		per gall. at works
Motor „ ..	1	3	„ 1	3½		„ „ „
90% „ ..	1	4	„ 1	4½		„ „ „
Pure „ ..	1	8	„ 1	8½		„ „ „

Contracts Advertised To-Day

Cookers, Heaters, &c.
Belfast Gas Department. [p. 302.]

Meters.
Belfast Gas Department. [p. 302.]

Repairs to Gasholder Framework.
Plymouth Gas Department. [p. 302.]

Big Coal Washery for China

Important developments are announced in connexion with the Kailan Mines which are situated near Tientsin, in North China. A contract has been placed by the Chinese Engineering and Mining Company, Ltd., on behalf of the Kailan Mining Administration, for a complete coal washery with a capacity of 500 tons of coal per hour. The washery is being supplied by Simon-Carves, Ltd., Cheadle Heath, near Manchester, and is to be erected at the Linsi Mine. The plant will be of the British "Baum" type specially designed to meet the local conditions, and will comprise the most modern developments in coal preparation, including completely automatic control, efficient sizing, water clarification and filtration, dust aspiration, and all necessary equipment for rapid mixing and loading of the various products.

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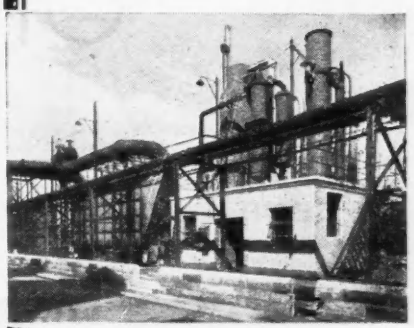

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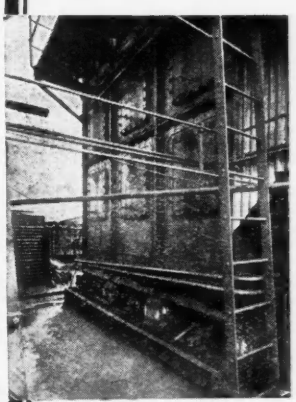

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- **Le Mans**
- **Motherwell**
- **Oldbury**
- **Perth**
- **Romford**
- **Slough**
- **Sydney**

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GAS STOCKS AND SHARES

Although the volume of business continued limited last week, the Account closed on a more cheerful note and prices generally began to harden. Gilt-edged stocks were depressed at the opening, but under the influence of heavier support later a number eventually closed fractionally higher than the previous week. The present low values of home rails attracted a few buyers, but traffic returns will have to improve considerably before investors return to this market in any numbers. Several upward movements occurred in the industrial section, especially among iron, steel, and aircraft shares, though many of the leaders were neglected. The greatest activity during the week centred round copper shares, despite a fall in the price of the metal, and several substantial improvements in value were recorded. Oil shares also became more active towards the close.

There were no features of special interest in the Gas market. The volume of business was just a shade heavier than a week ago and with few exceptions prices remained unchanged. Imperial Continental, which was marked *ex* div. on Monday, weakened again with a drop of 3 points to 114½, and British reacted 2 to 137½. A few minor movements appear in the Provincial Lists, while for the second week in succession nominal quotations in the Supplementary List closed unchanged.

There are several small parcels of stock in the list of gas preference issues on offer this week, which are not usually readily obtainable, giving yields a little above the average for this class of investment. Among these are the following:

Amount Offered.	——	Price.	Gross Flat Yield.
£			£ s. d.
225	Gas Consolidation 4½% Cum. £1	20/–	4 10 0
30	Guildford 6%	125	4 16
30	Romford 5½%	123	4 9 6
85	Tottenham 5%	112	4 9 0
60	Uxbridge 5%	111	4 10 0
50	Woking "C"	110	4 11 0

There is also a parcel of £12,000 Mossley and Saddleworth 4½% offered at 20s. 6d., free, giving a return of £4 8s.%.

Official Quotations on the London Stock Exchange

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Oct. 21.	Rise or Fall on Week.
1,767,439	Sept. 5	8	8	Alliance & Dublin Ord. ...	132—142	...
374,000	June 20	4	4	Do. 4 p.c. Deb. ...	93—108	...
734,733	May 9	5	5	Asscd. Gas & Water U'd'ts Ord.	17/6—19/6	...
500,000	,,	4½	4½	Do. 4½ p.c. Red. Cum. Pref.	19/—21/–	...
444,389	,,	§–/4	4	Do. 4 p.c. Red. Cum. Pref.	19/—20/–	...
296,523	,,	4	4	Do. 4 p.c. Irred. Cum. Pref.	16/—18/–	...
500,000	Sept. 5	3½	3½	Do. 3½ p.c. Red. Deb. ...	93—98	...
560,070	Aug. 22	7	7	Barnet Ord. 7 p.c.	157—162	...
300,000	Oct. 10	1/9½	1/4½	Bombay, Ltd.	24/—26/–*	...
180,435	Aug. 22	9½	9½	Bournemouth sliding scale ...	195—205	...
640,407	,,	7	7	Do. 7 p.c. max. ...	152—162	...
495,960	,,	6	6	Do. 6 p.c. Pref. ...	130—135	...
50,000	June 20	3	3	Do. 3 p.c. Deb. ...	75—80	...
312,025	,,	4	4	Do. 4 p.c. Deb. ...	95—100	...
335,000	,,	5	5	Do. 5 p.c. Deb. ...	115—120	...
357,900	Aug. 8	7½	7½	Brighton, &c., 6 p.c. Con. ...	142—147	...
659,955	,,	6½	6½	Do. 5 p.c. Con. ...	126—131	...
205,500	,,	6	6	Do. 6 p.c. 'B' Pref.	120—125	...
855,000	Sept. 19	8	7	British Ord.	135—140	–2
100,000	June 3	7	7	Do. 7 p.c. Pref.	140—145	...
350,000	,,	5½	5½	Do. 5½ p.c. 'B' Cum. Pref.	110—115	...
120,000	,,	4	4	Do. 4 p.c. Red. Deb. ...	95—100	...
450,000	,,	5	5	Do. 5 p.c. Red. Deb. ...	100—105	...
450,000	,,	3½	3½	Do. 3½ p.c. Red. Deb. ...	90—95	...
100,000	22 May'33	6	4	Cape Town, Ltd.	1—2	...
100,000	6 Nov.'33	4½	4½	Do. 4½ p.c. Pref. ...	1½—3½	...
150,000	June 20	4½	4½	Do. 4½ p.c. Deb. ...	60—70	...
626,860	July 18	6	6	Cardiff Con. Ord.	118—123	...
237,860	June 3	5	5	Do. 5 p.c. Red. Deb.	105—110	...
98,936	Sept. 19	2/–	2/–	Colombo Ord....	1½—1¾	...
24,510	,,	1/4½	1/4½	Do. 7 p.c. Pref.... ...	22/6—24/6	...
739,453	Oct. 10	–/11·48	–/11·48	Colonial Gas Assn. Ltd. Ord.	16/—18/–	...
296,144	,,	1/3·30	1/3·30	Do. 8 p.c. Pref. ...	22/6—24/6*	...
1,775,005	Aug. 8	5	5	Commercial Ord.	79—84	...
140,000	,,	—	§13/4	Do. 4 p.c. Red. Pref.	95—100	...
620,000	June 3	3	3	Do. 3 p.c. Deb. ...	70—75	...
286,344	Aug. 22	5	5	Do. 5 p.c. Deb. ...	113—118	...
200,000	,,	—	§30/2	Do. 3½ p.c. Red. Deb.	95—100	...
807,560	Aug. 8	7	7	Croydon sliding scale ...	135—140	...
644,590	,,	5	5	Do. max. div. ...	100—105	...
620,385	June 20	5	5	Do. 5 p.c. Deb. ...	113—118	...
239,000	Aug. 8	5	5	East Hull Ord. 5 p.c.	95—100	...
186,155	Aug. 8	6	6	East Surrey Ord. 5 p.c. ...	116—121	...
176,211	June 3	5	5	Do. 5 p.c. Deb. ...	112—117	...
250,000	July 4	4	8	Gas Consolidation Ord. 'B' ...	19/—21/–	...
250,000	May 9	4	4	Do. 4 p.c. Red. Cum. Pref.	17/6—19/6	...
9,223,324	Aug. 8	5⅝	5⅝	Gas Light & Coke Crd. ...	22/—24/–a	...
2,600,000	,,	3½	3½	Do. 3½ p.c. max. ...	76—81	...
4,477,106	,,	4	4	Do. 4 p.c. Con. Pref....	97—102	+1
2,993,000	July 4	—	3½	Do. 3½ p.c. Red. Pref....	98—103	...
8,602,497	May 23	3	3	Do. 3 p.c. Con. Deb....	77—80	–1
3,642,770	,,	5	5	Do. 5 p.c. Red. Deb....	110—115	...
3,500,000	,,	4½	4½	Do. 4½ p.c. Red. Deb....	109—112	...
700,000	Sept. 5	3½	3½	Do. 3½ p.c. Red. Deb....	93—98	...
270,466	Aug. 22	6	6	Harrogate New Cons. ...	117—122	...
157,500	Mar. 21	1/2½	‡1/–	Hong Kong and China Ord....	1—1	...
213,200	Aug. 8	6	5⅝	Hornsey Con. 3½ p.c ...	97—102	...
5,600,000	May 9	8	12	Imperial Continental Cap ...	112—117	–3
223,130	July 18	3½	3½	Do. 3½ p.c. Red. Deb....	87—92	...
235,242	Aug. 8	8½	8½	Lea Bridge 5 p.c. Ord. ...	164—169	...
11,751	Aug. 22	10	8	Maidstone 5 p.c. Cap. ...	175—185	...
63,480	June 20	3	3	Do. 3 p.c. Deb.... ...	70—75	...
45,000	May 23	†10	†10	Malta & Mediterranean ...	135—140	...
				Metropolitan (of Melbourne)		
392,000	Oct. 3	5½	5½	5½ p.c. Red. Deb.	97—100	...
231,977	Aug. 22	5	5	M.S. Utility 'C' Cons. ...	99—104	...
968,658	,,	4	4	Do. 4 p.c. Cons. Pref.	95—100	...
390,076	June 20	4	4	M.S. Utility 4 p.c. Deb. ...	95—100	...
148,955	,,	5	5	Do. 5 p.c. Deb. ...	113—118	...
125,000	July 1	3½	3½	Do. 3½ p.c. Red. Bds.	95—98	...
675,000	May 9	†6	†6	Montevideo, Ltd.	73—78	...
250,000	Aug. 8	7½	7½	North Middlesex 6 p.c. Con.	142—147	...
396,160	Aug. 8	5	5	Northampton 5 p.c. max. ...	105—110	...
300,000	Apl. 25	†9	†7	Oriental, Ltd.	147—152	...
468,537	June 3	8	8	Plymouth & Stonehouse 5 p.c.	140—150	...
621,667	Aug. 8	8½	8½	Portsmouth & Gosport Cons.	157—162	...
241,446	,,	5	5	Do. 5 p.c. max. ...	100—105	...
73,350	,,	5	5	Do. 5 p.c. Pref. ...	107—112	...
75,000	,,	4	4	Do. 4 p.c. Pref. ...	90—95	...
114,000	Aug. 8	5	5	Preston 5 p.c. Pref.	105—110	...
247,966	June 3	4	4	Primitiva 4 p.c. Cons. Deb. ...	98—103	...
625,959	July 18	4	4	Do. 4 p.c. Red. Deb. ...	94—99	...
15,000	Sept. 5	6	6	San Paulo 6 p.c. Cum. Pref. ...	8½—9	...
441,275	Sept. 19	1/1½	1/1½	Severn Val. Gas Cor. Ld. Ord.	20/6—22/6	...
460,810	Sept. 19	–/10½	–/10½	,, ,, 4½ p.c. Cum. Pref.	19/6—21/6	...
133,201	Aug. 22	5	8½	Shrewsbury 5 p.c. Ord. ...	127—132	...
9,000	June 3	4	‡4	South African Ord.	4½—5½	...
1,371,752	Aug. 22	1/2⅜	1/2⅜	South East'n Gas Cn. Ld. Ord.	21/—23/–	...
871,636	,,	–/10½	–/10½	Do. 4½ p.c. Red. Cum. Pref.	19/6—21/6	–/6
498,818	,,	4	4	Do. 4 p.c. Cum. Pref. ...	18/—20/–	...
450,000	Aug. 8	4	4	Do. 4 p.c. Deb.	99—102	...
150,000	,,	3½	3½	Do. 3½ p.c. Red. Deb. ...	94—97	...
6,709,895	Aug. 8	6	5	South Met. Ord.	103—106	...
1,135,812	,,	6	6	Do. 6 p.c. Irred. Pref. ...	125—130	...
850,000	,,	4	4	Do. 4 p.c. Irred. Pref. ...	95—100	...
1,895,445	June 20	3	3	Do. 3 p.c. Deb.	75—80	...
1,000,000	July 4	5	5	Do. 5 p.c. Red. Deb. ...	107—112	...
600,000	,,	—	§31/–	Do. 3½ p.c. Red. Deb. ...	97—102	...
1,543,795	Aug. 8	6	6	South Suburban Ord. 5 p.c. ...	113—118	...
512,825	,,	5	5	Do. 5 p.c. Pref.... ...	108—113	...
500,000	,,	4	4	Do. 4 p.c. Pref.... ...	95—100	...
250,000	,,	3½	3½	Do. 3½ p.c. Red. Pref. ...	90—95	...
888,587	June 3	5	5	Do. 5 p.c. Deb.... ...	113—118	...
250,000	,,	4	4	Do. 4 p.c. Deb.... ...	95—100	...
200,000	Aug. 8	3½	3½	Do. 3½ p.c. Red. Deb. ...	90—95	...
427,859	Sept. 19	8⅜	9⅜	S. Western Gas & Water Ord.	16/—18/–	...
160,523	Oct. 10	–/10½	–/10½	Do. 4½ p.c. Red. Cum. Pf.	19/—21/–*	...
110,000	June 3	4	4	Do. 4 p.c. Red. Deb. ...	95—100	...
750,541	Aug. 8	5½	5	Southampton Ord. 5 p.c. ...	105—110	...
148,836	June 3	4	4	Do. 4 p.c. Deb. ...	95—100	...
350,000	Aug. 8	5½	5½	Swansea 5½ p.c. Red. Pref. ...	105—110	...
200,000	June 3	3½	3½	Do. 3½ p.c. Red. Deb. ...	93—98	...
1,076,490	Aug. 8	6⅝	6⅝	Tottenham and District Ord.	125—130	...
409,835	,,	5½	5½	Do. 5½ p.c. Pref. ...	115—120	...
62,235	,,	5	5	Do. 5 p.c. Pref. ...	108—113	...
334,615	June 3	4	4	Do. 4 p.c. Deb. ...	95—100	...
85,701	Apl. 25	6	6	Tuscan 6 p.c. Red. Deb. ...	95—101	...
1,131,550	Aug. 22	6	4	U. Kingdom Gas Cor. Ord. ...	17/—20/–	...
1,051,280	May 9	4½	4½	Do. 4½ p.c. 1st Cum. Pref.	19/—21/–	...
762,241	,,	–/11·15	4	Do. 4 p.c. 1st Red. Cum. Pf.	19/—21/–	...
745,263	June 3	4½	4½	Do. 4½ p.c. 2nd Non-Cum.Pf.	16/—18/–	...
1,066,186	Sept. 5	3½	3½	Do. 3½ p.c. Red. Deb. ...	95—98	...
375,689	Aug. 8	7	7	Uxbridge, &c., 5 p.c.	125—130	...
133,010	,,	5	5	Do. 5 p.c. Pref. ...	108—113	...
1,371,138	Aug. 8	7	7	Wandsworth Consolidated ...	135—140	...
2,525,768	,,	4	4	Do. 4 p.c. Pref. ...	95—100	...
1,343,964	June 3	5	5	Do. 5 p.c. Deb. ...	113—118	...
383,745	,,	4	4	Do. 4 p.c. Deb. ...	95—100	...
400,000	,,	—	§25/–	Do. 3½ p.c. Red Deb.	97—102	...
558,342	Aug. 8	7	6⅔	Watford and St. Albans Ord.	128—133	...
200,000	,,	5	5	Do. 5 p.c. Pref. ...	107—112	...
200,000	,,	5⅓	5⅓	Do. 5⅓ p.c. Pref. ...	110—115	...
200,000	,,	—	16/8§	Do. 4 p.c. Red. Pref.	95—100	...
200,000	June 3	4	4	Do. 4 p.c. Red. Deb.	96—101	...
200,000	,,	3½	3½	Do. 3½ p.c. Red. Deb.	90—95	...

a.—The quotation is per £1 of stock. * Ex. div. † Paid free of income-tax. ‡ For year. § Actual.

Supplementary List and Provincial Exchanges overleaf.

STOCK AND SHARE LIST—Cont.

Supplementary List, not Officially Quoted, London

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Nominal Quotations Oct. 21.	Rise or Fall on Week.
202,152	Sept. 5	5	5	Ascot Ord.	101—106	...
128,182	July 18	5	5	Do. 5 p.c. Pref.	108—113	...
31,035	Aug. 22	-/4	-/4½	Associated Utilities 4 p.c. Pref.	16/-—18/-	...
100,000	Dec. 13	...	3½	Do. 3½ p.c. Red. Deb. ...	95—100	...
17,000	Aug. 22	8	8	Bognor Orig. Ord. 'A' ...	155—165	...
62,210	,,	8	8	Do. New Addl. 'A' ...	155—165	...
87,160	,,	7	7	Do. New 7 p.c. max. ...	145—155	...
37,440	Aug. 8	10	10	Cam. Univ. & Town 10 p.c. max.	165—198	...
125,970	,,	7	7	Do. 7 p.c. max.	133—138	...
39,025	,,	5	5	Do. 5 p.c. max.	97—102	...
96,410	July 18	4½	4½	Cardiff 4½ p.c. Pref.	95—100	...
150,000	Aug. 8	4	4	Croydon 4 p.c. Pref.	97—100	...
130,000	June 20	4	4	Do. 4 p.c. Deb.	95—100	...
65,000	Aug. 8	8½	7½	Eastbourne 'A' 5 p.c. ...	140—145	...
198,000	,,	7	6	Do. 'B' 3½ p.c.	114—119	...
112,312	,,	5	5	Do. 5 p.c. Pref.	107—112	...
130,000	June 20	5	5	Do. 5 p.c. Deb.	112—117	...
24,000	Aug. 8	8½	8½	Great Yarmouth 8½ p.c. max.	43—48	...
59,400	,,	7½	7½	Do. 7½ p.c. max.	33—38	...
51,160	June 3	5½	5½	Do. 5½ p.c. Deb.	121—126	...
152,600	Sept. 5	9	8	Guildford Cons.	163—168	...
54,055	,,	5	5	Do. 5 p.c. Pref.	107—112	...
68,250	June 3	5	5	Do. 5 p.c. Deb.	107—112	...
156,600	Aug. 22	7½	7½	Hampton Court Cons. ...	131—136	...
80,000	Aug. 8	4	4	Lea Bridge 4 p.c. Pref. ...	90—95	...
60,000	,,	6	6	Do. 6 p.c. Pref.	121—126	...
94,876	June 3	4	4	Do. 4 p.c. Deb.	95—100	...
73,620	Sept. 5	8½	8½	Luton Cons. 'A'	153—163	...
107,960	Sept. 19	5½	4	Mid Kent Ord.	8¼—9¼	...
230,940	Aug. 8	10	10	Oxford & District Ord. ...	195—200	...
47,112	,,	5	5	Do. 5 p.c. Pref.	106—111	...
50,000	,,	6	6	Do. 6 p.c. Red. Pref. ...	107—112	...
126,193	May 9	7½	7½	Peterborough Ord.	135—145	...
64,990	Sept. 5	6½	7½	Redditch Ord....	118—128	...
166,850	Aug. 8	8	8	Romford Ord....	142—147	...
60,000	,,	4	4	Do. 4 p.c. Pref.	97—100	...
44,000	Sept. 19	5	5	Do. 5 p.c. Deb.	112—117	...
25,570	Aug. 8	5½	5½	Rugby 5½ p.c. Pref.	120—125	...
25,000	,,	6	6	Do. 6 p.c. Red. Pref ...	104—109	...
42,750	June 3	5½	5½	Do. 5½ p.c. Deb.	118—123	...
110,950	Aug. 22	8	8	Ryde Ord.	140—150	...
270,086	Sept. 5	7	7	Slough Ord.	128—133	...
21,000	June 20	5	5	Do. 5 p.c. Deb.	110—115	...
28,872	May 9	5½	5½	S. Midland Gas Cpn. Ltd. Ord.	19/-—21/-	...
28,866	Sept. 5	4½	4½	Do. 4½ p.c. Red. Cum. Pref.	18/-—20/-	...
117,228	Aug. 8	7	5	Swindon Cons.	102—107	...
60,425	June 3	5	5	Do. 5 p.c. Deb.	112—117	...
64,380	June 3	5	5	Torquay & Paignton 5 p.c. Pref.	107—112	...
130,000	Aug. 8	8	5	Wakefield Ord.	116—121	...
81,650	,,	5	5	Do. 5 p.c. max.	100—105	...
82,000	Aug. 8	6	6	Weymouth Ord.	103—108	...
98,384	Aug. 22	6	6	Wolverhampton 6 p.c. Pref.	118—123	...
160,000	June 20	5½	5½	Do. 5½ p.c. Rd. Db.	105—110	...
90,000	June 20	5	5	York 5 p.c. Red. Deb. ...	104—109	...
133,640	July 18	6½	6½	Yorktown (Cam.) 5 p.c. Cons.	118—123	...
120,000	,,	5	5	Do. 5 p.c. Pref.	105—110	...
35,000	June 3	5½	5½	Do. 5½ p.c. Deb.	120—125	...

BRISTOL EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Oct. 21.	Rise or Fall on Week.
347,756	July 18	6	5	Bath Cons.	117—119	...
1,667,250	July 18	5	5	Bristol, 5 p.c. max.	111—114	...
120,420	June 3	4	4	Do. 1st 4 p.c. Deb. ...	100—102	+1
217,870	,,	4	4	Do. 2nd 4 p.c. Deb. ...	100—102	+1
328,790	,,	5	5	Do. 5 p.c. Deb.	119—122	...
274,000	Aug. 8	5	5	Newport (Mon). 5 p.c. max....	97—99	...
13,200	Sept. 19	8*	7	Pontyp'l Gas & W. 10 p.c. 'A'	12⅝—13⅝	...
13,600	,,	6	5	Do. 7 p.c. 'B'	11⅛—12⅛	...
40,000	,,	6	5	Do. 7 p.c. 'C'	11⅛—12⅛	...
140,778	Aug. 8	5	5	Weston-super-Mare Cons. ...	108—110	...
64,338	June 20	4	4	Do. 4 p.c. Deb.	100—102	...
33,340	,,	7½	7½	Do. 7½ p.c. Deb.	151—154	...

LIVERPOOL EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Oct. 21.	Rise or Fall on Week.
157,150	Aug. 8	6½	5	Chester 5 p.c. Ord.	109—111	...
92,500	June 20	4	4	Do. 4 p.c. Pref.	95—99	...
36,430	,,	3½	3½	Do. 3½ p.c. Deb.	87—90	...
41,890	,,	4	4	Do. 4 p.c. Red. Deb. ...	97—101	...
2,167,410	Aug. 22	6	6	Liverpool 5 p.c. Ord.... ...	121—123	...
248,500	June 20	5	5	Do. 5 p.c. Red. Pref. ...	97—102	...
306,083	July 18	4	4	Do. 4 p.c. Deb....	100—102	...
106,280	Aug. 8	10	10	Preston 'A' 10 p.c.	198—208	...
188,219	,,	7	7	Do. 'B' 7 p.c.	131—141	...

NEWCASTLE EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Oct. 21.	Rise or Fall on Week.
122,577	Aug. 8	8	8	Blyth 5 p.c. Ord.	161—163	...
732,000	Aug. 22	5	5	Hartlepool G. & W. Co. & New	89½—90½	—1
2,061,315	Aug. 8	5½	5	Newcastle & Gateshead Con.	22/—22/6a	—/3
682,856	,,	4	4	Do. 4 p.c. Pref. ...	99—100	...
776,706	June 20	3½	3½	Do. 3½ p.c. Deb. ...	88—89	...
277,285	May 9	5	5	Do. 5 p.c. Deb. '43 ...	103½—105½	...
332,351	Aug. 22	6	6	Sunderland 6 p.c. max. ...	135—136	...

NOTTINGHAM EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Oct. 21.	Rise or Fall on Week.
542,270	Aug. 8	9	6	Derby Con.	133—143	...
55,000	June 3	4	4	Do. 4 p.c. Deb.	100—105	...
20,000	June 20	5	5	Long Eaton 5 p.c. Pref. ...	10—12	...
80,000	,,	5	5	Do. 5 p.c. Deb. ...	105—110	...

SHEFFIELD EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Oct. 21.	Rise or Fall on Week.
10,000	Aug. 8	10	10	Great Grimsby 'A' Ord. ...	205—215	...
6,500	,,	10	10	Do. 'B' Ord. ...	205—215	...
79,000	,,	10	10	Do. 'C' Ord. ...	195—205	...
1,806,339	Aug. 22	6½	6½	Sheffield Cons.	129—141	...
95,000	July 4	4	4	Do. 4 p.c. Deb.	101—103	...

a The quotation is per £1 of Stock. * Ex div.

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